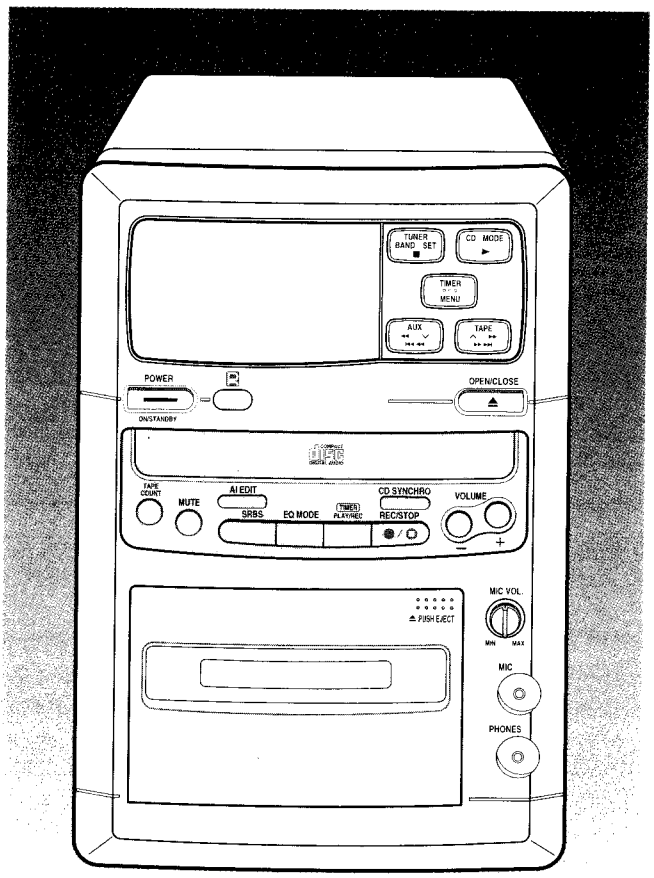
SAMSUNG

MICRO COMPONENT SYSTEM

MM-77

SERVICE Manual

MICRO COMPONENT SYSTEM



CONTENTS

1. Precaution ..... 1~9
2. Specification 10
3. Location of controls ..... 11~13
4. Disassembly instruction ..... 14~15
5. Basic circuit operation ..... 16~17
6. Troubleshooting ..... 18~26
7. Adjustment ..... 27~32
8. Block diagram ..... 33~34
9. Exploded view & parts list ..... 35~41
10. Schematic diagram ..... 42~44
11. PCB Pattern and Marking diagram ..... 45~48
12. Wiring diagram 49
13. IC & TR internal diagram ..... 50~57
14. Electrical parts list ..... 58~67
15. List of Abbreviation 68

*Design and specification are subject to change upon improvement without prior notice.

1. Safety precaution

1-1. Class 1 laser product

This laser disc player is classified as a CLASS 1 laser product.

1-2. Laser warning label

The label shown below may be affixed or not according to country.

(UL)

This Product Complies with DHHS Rules 21CFR, Sub chapter J.At date of Manufacture

(CSA)

CERTIFIED ONLY TO CANADIAN ELECTRICAL CODE.

CERTIFIE EN VERTU DU CODE CANADIAN DE LELETRICITE SEULEMENT

(EU)

CLASS 1
LASER PRODUCT

Location: Enclosure back.

(SCAN)

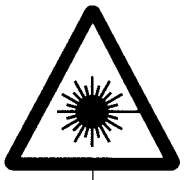
CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED AVOIDEXPOSURE TO BEAM

ADVARSEL: USYNLIG LASERSTRALING VED ABNING NAR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGA UDSAETTELSE FOR STRALING

VARO: AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTINA NAKYMATTOMALLE LASERSATEILYLLE ALA KATSO SATEESEEN!

VARNING: OSYNLIG LASERSTRÅLNING NAR DENNA DEL AR OPPNAD OCH SPARREN AR URKOPPLAD BETRAKTA EJSTRALEN!

(EU)



Location : on the disc clamper or inner side of UNIT door or nearby UNIT chassis.

UL	: Manufactured for U.S.A. Market.
CSA	: Manufactured for Canadian Market.
EU	: Manufactured for European Market.
SCAN	: Manufactured for Scandinavian Market.

1-3. Laser beam warning

ADVERSEL –Usynlig saserstråling ved åbning, når Sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

VARNING –Osylig laserstralning när denna del är öppnad och spärr är urkopplad. Stralen är farlig.

VARITUS –Laite sisältää laserdiodin, joka lähettää näkymätönta silmille vaarallista lasersateilyä.

CAUTION –Invisible laser radiation when door is open and interlocks defeate. Avoid exposure to beam.

1-4. Laser diode specification (Optical pick-up)

- Material : GaAs+GaAlAs
- Wavelength : 760-800nm
- Emission duration : Continuous
- Laser Output : 0.2mW
  * This output is the value measured at distance 1.6mm from the objective lens surface on the optical pick-up block.
- Classification : CLASS 1

1-5. Warning for servicing

WARNING: When servicing, do not approach the LASER exit with the eye too closely. In case it is necessary to confirm LASER beam emission, be sure to observe from a distance of more than 30cm from the surface of the objective lens on the optical pick-up block.

VARNING: När underhållningsarbeten utförs, närma dig försiktigt och se inte på laserutstrålningen på för näre häll. If all det är nödvändigt att betrygga laserstrålens utströmning. Var säker att kontrollera detta från ett avståand av mer än 30cm (11.81 inch.) fråan den objektiva linsens yta på den optiska utsåndningspunkten.

ADVARSEL: När repareringsarbejdet udfoeres, naerm dig forsigtigt og se ikke på laserudstrålingen påa for naer håand. ^t ilfaeldet at det er noedvaendigt at bestemme laserstrålens udstråling. Vaer sikker på kontrollere dette fra en afstand af mere end 30cm (11.81 inch.) fra den objektive linses overflade på den optiske udsendningspunkt.

VAROITUS: Silmiä on varottava viemästä liian läbeile laser-poistokanavaa huoiion aikana. Jos on välttämätöntä varmistaa Laser-Säteen päästö, pysyttels sitä tarkasteltaessa vähintään 30cm etäiyydellä optisen lukon objecktiivilinssin pinnasta..

1-1-6. Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

(1) Be sure that no built-in protective devices are defective or have been defeated during servicing. (1) Protective shields are provided to protect both the technician and the customer. Correctly replace all missing protective shields, including any remove for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.

(2) Be sure that there are no cabinet openings throught which adults or children might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, excessively wide cabinet ventilation slots, and an improperly fitted and/or incorrectly secured cabinet back cover.

(3) Leakage Current Hot Check-With the instrume-nt completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use a isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1270 (40.7). With the instrument's AC switch first in the ON positin and then in the OFF position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinets, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis.

Any current measured must not exceed 0.5 millamp. Reverse the instrument power cord plug in the outlet and repeat the test.

See Figure 1.

Any measurements not within the limits specified herein indicate a potential shock hazard that must be ellminated before returning the instrument to the customer.

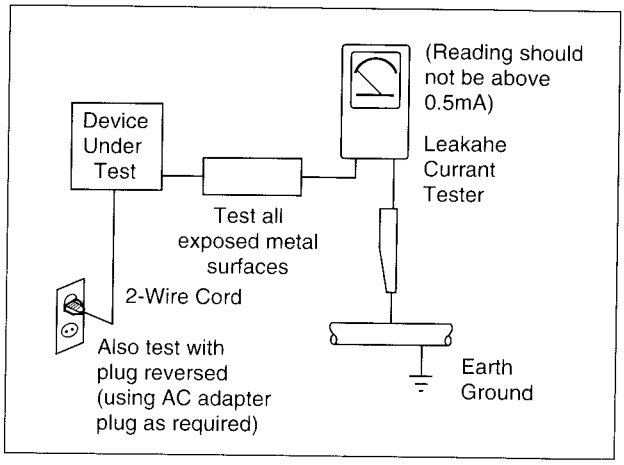

(Reading should not be above 0.5mA)
Device Under Test
Leakahe Currant Tester
Test all exposed metal surfaces
2-Wire Cord
Also test with plug reversed (using AC adapter plug as required)
Earth Ground

FIG. 1 AC Leakage Test

(4) Insulation Resistance Test Cold Check-(1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug. (2) Turn on the power switch of the instrument. (3) Measure the resistance with an ohmmeter between the jumpered AC plug and all exposed metallic cabinet parts on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. When an exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 megohm. When there is no return path to the chassis, the reading must be infinite. If the reading is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repared and rechecked before it is returned to the customer.

See Figure 2.

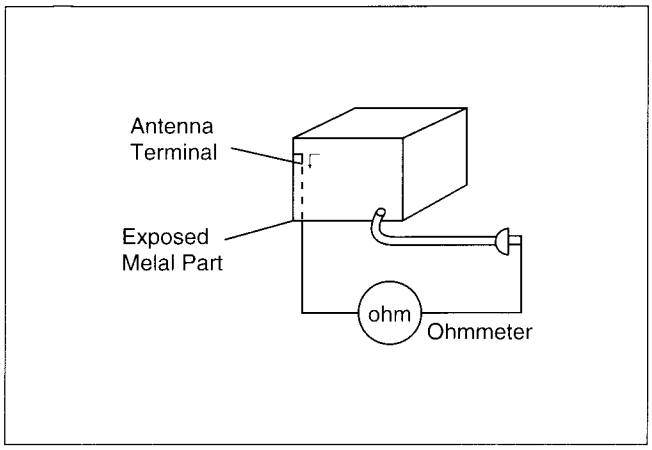


FIG. 2 Insulation Resistance Test

1-1-7. Read and comply with all caution and safety-related notes non or inside the cabinet, or on the chassis.

1-1-8. Design Afteration Warning-Do not alter or add to the mechanical or electrical design of this instrument. Design alterations and additions, including but not limited to, circuit modifications and the addition of items such as auxiliary audio output connections, might alter the safety characteristics of this instrument and create a hazard to the user. Any design alterations or additions will make you, the servicer, responsible for personal injury or property damage resulting therefrom.

1-1-9. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: (1) near sharp edges, (2) near thermally hot parts (be sure that leads and components do not touch thermally hot parts), (3) the AC supply, (4) high voltage, and (5) antenna wiring. Always inspect in all areas for pinched, out-of-place, or frayed wiring. Do not change spacing between a component and the printed-circuit board. Check the AC power cord for damage.

1-1-10. Components, parts, and/or wiring that appear to have overheated or that are otherwise damaged should be replaced with components, parts and/or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

1-1-11. Product Safety Notice-Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by shading, an (*) or a (⚠) on schematisc and parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might created shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

2. Servicing notes

2-1. Before servicing the unit

Be sure to observe the safety notes attached on label, chassis, cabinet top, cabinet bottom and printed circuit board.

2-1-1. Caution on laser beammalfunction

Do not try to access objective lens, when DISC is not on the tray.

When pick-up mechanism replacement is required, be sure to turn power off.

2-1-2. When handling parts

Tube, tape or insulating parts are used for sepa-ration or insulation purposes. Especially parts which generate excessive heat are kept away from PCB or any other sensitive parts. Therefore, when replacing parts, be sure to replace them in their original position.

2-1-3. When fixing wires

Wires should be fixed in such a way with cable-tie so they won't move.

When finished servicing, be sure to leave unit in it's original configuration.

2-1-4. Use specified parts only

The safety specification built into the electronics of this unit require that you use specified parts only. Do not use any other replacements. Using other parts can result in electrical and fire hazard.

2-1-5. After servicing is complete

After servicing is complete, check if there are any missing parts or that wires are properly fixed and any place where over heating or shock is likely to occur, can be found.

2-1-6. Handling the optical pick-up

* The laser diode in the optical pick up may suffer electrostatic breakdown because of potential static electricity from clothing and your body.

The following method is recommended.

(1) Place a conductive sheet on the work bench (The black sheet used for wrapping repair parts.)

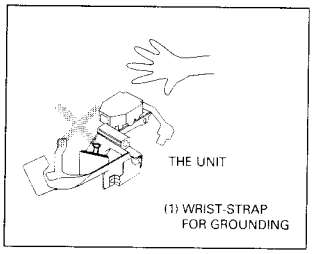
(2) Place the set on the conductive sheet so that the chassis is grounded to the sheet.

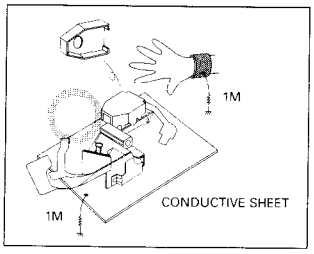
(3) Place your hands on the conductive sheet (This gives them the same ground as the sheet).

(4) Remove the optical pick up block.

(5) Perform work on top of the conductive sheet. Be careful not to let your clothes or any other static sources to touch the unit.

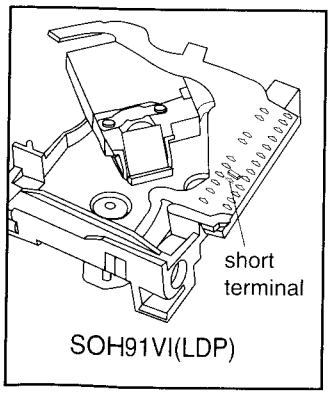
* Be sure to put on a wrist strap grounded to the sheet.
* Be sure to lay a conductive sheet made of copper etc. which is grounded to the table.



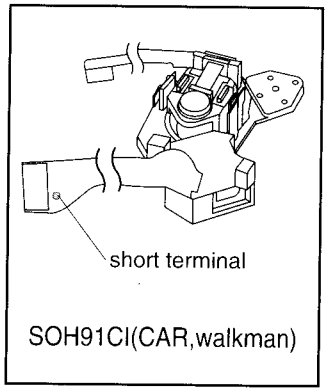


(6) Short the short terminal on the PCB, which is inside the Pick-Up ASS'Y, before replacing the Pick-Up.
(The short terminal is shorted when the Pick-Up Ass'y is being lifted or moved.)

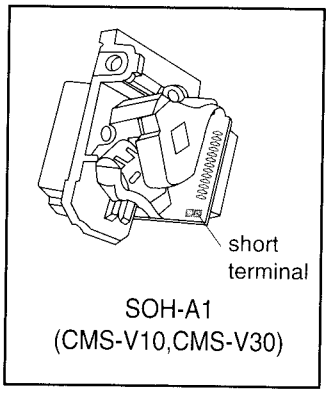
(7) After replacing the Pick-up, open the short terminal on the PCB.



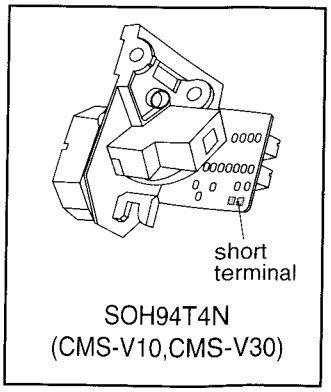
SOH91VI(LDP)



SOH91CI(CAR,walkman)



SOH-A1
(CMS-V10,CMS-V30)



SOH94T4N
(CMS-V10,CMS-V30)

2-2. Servicing Precautions

CAUTION: Before servicing Instruments covered by this service manual and its supplements, read and follow the Safety Precautions section of this manual.

Note: If unforseen circument create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.
Remember: Safety First.

2-2-1. General Servicing Precautions

(1) a. Always unplug the instrument's AC power cord from the AC power source before (1) removing or reinstalling any component, circuit board, module or any other instrument assembly, (2) disconnecting any instrument electrical plug or other electrical connection, (3) connecting a test substitute in parallel with an electrolytic capacitor in the instrument.

b. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.

c. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

d. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the test instrument positive lead.
Always remove the test instrument ground lead last.

Note: Refer to the Safety Precautions section ground lead last.

(2) The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.

(3) The components used in the unit have a specified flame resistance and dielectric strength. When replacing components, use components which have the same ratings. Components identified by shading, by (*) or by (⚠) in the circuit diagram are important for safety or for the characteristics of the unit. Always replace them with the exact replacement components.

(4) An insulation tube or tape is sometimes used and some components are raised above the printed wiling board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install such elements as they were.

(5) After servicing, always check that the removed screws, corponents, and wiring have been installed correctly and that the portion around the serviced part has not been damaged and so on. Further, check the insulation between the blades of the attachment plug and accessible conductive parts.

2-2-2. Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power ON. Connect the insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (see note) should be more than 1 Megohm.

Note: Accesible conductive parts include metal panels, input terminals, earphone jacks, etc.

2-3. ESD, Precautions

Electrostatically SensitiveDevices (ESD)

Some semiconductor (solid state) devices can be damaged easily by static electricity.
Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

(1) Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic aharge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

(2) After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

(3) Use only a grounded-tip soldering iron to solder or unsolder ESD devices.

(4) Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESD devices.

(5) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damge ESD devices.

(6) Do not remove a replacement ESD device from its protective package until immediately before your are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).

(7) Immediately before removing the protective materials from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

(8) Minimize bodily motions when handling unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

3. Chip replacement

3-1. Precaution for the Chip Replacement

(1) Do not touch the part body directly with the soldering iron. ICS, especially TSOP, are easily damaged by heat.
(2) Use care regarding soldering iron tip and avoid rapidly heating parts. Some parts can be damaged by sudden heating. Preheat the part at about 100°C for several minutes before installing it.
(3) Use soldering tip temperature of about 240°C or larger parts, use a slightly higher temperature (about 280°C).
(4) The thin (0.3mm) solder for miniature parts does not contain adequate flux. Supplementary flux is thus needed in most cases.

The NoteMaster 486S/25N series systems are manufactured using flux which can be cleaned by water in the factory. When your replace the part or troubleshooting, use proper flux and solder which can be cleaned by water. Soldering area will corrode, if proper flux and solder are not used in replace. And it may cause a fatal error to the system.

(5) Use care not to damage the circuit pattern, especially when removing.
(6) Because of the many pins, cleanliness of the pattern is extremely important after removing the IC.
(7) Use care to avoid solder bridges. Remove any that occurs.
(8) Position the part carefully. This will also affect the soldering operation. Be very precise in positioning the IC. Soldering opposite pins first holds the IC in place and makes soldering the other pins easier.
(9) Do not reuse removed parts.
(10) Check for solder joints, especially miniature parts with small lead.
(11) A defective trimming resistor cannot be adjusted externally. Replace with an ordinary variable resistor.
(12) It is important to inspect the work with a magnifier. Check after installing (cold solder joints, etc).

3-2. Tools for the Chip Replacement

The tools for the chip replacement are as follows:

(1) Thin tip type soldering iron
(2) Small flat-blade tip type soldering iron
(3) Special desoldering tip iron
(4) Airblower unit
(5) Flat Package Pick-up
(6) Flux can be cleaned by water
(7) 0.3mm thin solder can be cleaned by water
(8) Desoldering wire
(9) Tweezers

3-3. Chip Resistors and Chip Capacitors

3-3-1. Kind jof the Part

The kind of chip resistors and chip capacitors as follows

(1) Thick Film Chip Resistors
(2) Carbon Film Chip Resistors
(3) Metal Film Chip Resistors
(4) Chip Ceramic Capacitors
(5) Chip Trimming Resistors

3-3-2. Removing the Part

The kind of chip resistors and chip capacitors as follows

(1) Using two soldering irons:
① Use thin tip soldering irons.
② Use soldering tip temperature of about 280°C
③ Simultaneously heat both ends of the part.
④ While heating, grasp the part with the tips of the soldering irons and remove it.
⑤ Use desoldering wire to completely remove the old solder from the part location of the board.
⑥ A clean pattern for installing the new part is very important.

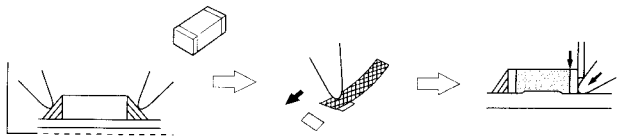


FIG. 4

3-3-3. Installing the Part

(1) Clean the area where the new part is to be mounted.
(2) Apply flux.
(3) Set part correctly into position, prevent it from shifting.
(4) Bring the soldering iron tip close to the part contact without actually touching it. Melt thin (0.3mm) solder between the tip and part so that it flows into the part contact.
(5) Check work quality with a magnifier.

3-4. Chip Tantalum Capacitors and Chip Filters

3-4-1. Kind of the Part

The kind of chip tantalum capacitors and chip filters are as follows:

(1) Chip Inductors
(2) Chip Tantalum Capacitors
(3) Chip Tantalum Electrolytic Capacitors
(4) Chip Aluminum Electrolytic Capacitors
(5) Chip Transformers
(6) Chip Filters

3-4-2. Removing the Part

(1) Using special desoldering iron:
① Select soldering tip according to part size.
② Bring the tip into contact with the soldered points.
③ When the solder melts, remove the part.
④Remove the old solder with desoldering wire.

(1) Using two soldering irons:
① Use small flat-blade tips.
② Heat both ends of the part simultaneously.
③ When the solder melts, grasp and remove the part with the soldering iron tips.
④ Remove the old solder with desoldering wire.

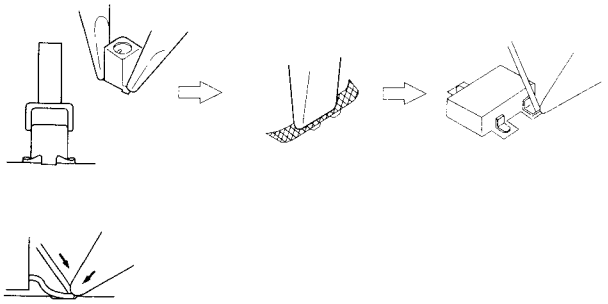


FIG. 5

3-4-3. Installing the Part

(1) Clean the area where the new part is to be mounted.
(2) Apply flux
(3) In part correctly into position, prevent it from shifting.
(4) Use sharp soldering iron tip. Bring close to the part contact without actually touching it. Melt thin solder between the tip and part so that if flows into the part contact.
(5) Check work quality with a magnifier.

3-5. Chip VRs, Chip Trimmer Capacitors, Diodes and Tr.

3-5-1. Kind of the Part

The kind of the part is as follows:

(1) Chip VRs
(2) Chip Trimmer Capacitors
(3) Diode
(4) Transistors

3-5-2. Removing the Part

(1) Using two soldering irons:
① Use small flat-blade tips.
② Heat the leads of the part simultaneously.
③ When the solder melts, grasp and remove the part with the soldering iron tips.
④ Remove the old solder with desoldering wire.

3-5-3. Installing the Part

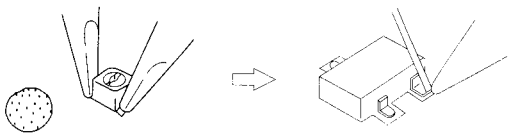


FIG. 6

(1) Clean the area where the new part is to be mounted.
(2) Apply flux
(3) Set part correctly into position, prevent it from shifting.
(4) Use sharp soldering iron tip. Bring close to the part contact without actually touching it. Melt thin solder between the tip and part so that it flows into the part contact.

3-6. Chip ICs

3-6-1. The kind of the Chip ICs

The kind of the chip ICs are as follows:

(1) SOP (Small Outline Package) IC
(2) SSOP (Shrink Small Outline Package) IC
(3) VSOP (Very Small Outline Package) IC
(4) QFP (Quad Flat Package) IC
(5) VQFP (Very Quad Flat Package) IC
(6) PLCC (Plastic Leaded Chip Carrier) IC
(7) TSOP (Thin Small Outline Package) IC

3-6-2. Removing the Part

(1) Using special desoldering iron:
① Select the tip according to the size and shape of the IC.
② Thin" the tip with a small amount of the IC leads.
③ Set the tip squarely over the IC leads.
④ When the solder melts, carefully twist the iron.
⑤ Raise and remove the IC.

(2) Using shaped airblower unit:
① Select the correct nozzle.
② Select the temperature and airblow (suggested: temperature: 7, airblow: 4)
③ Engage the IC removing tool.
④ Use the airblow to preheat the IC for about 5 seconds, then heat with the nozzle until the IC remover lifts the part from the board.

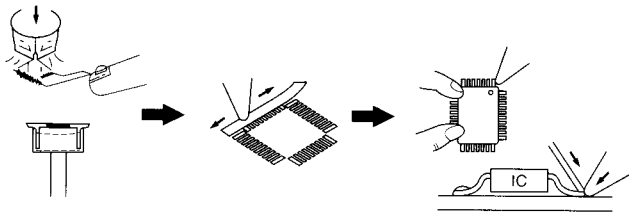


FIG. 7

3-6-3. Installing the Part

(1) Use desoldering wire to remove the previous older.
(2) Clean the location.
(3) Apply flux.
(4) Position the IC and solder two pins at opposite sides.
(5) Use a sharp tipped soldering iron and carefully solder each pin. (After graining experience, a thicke tip can be used for better work efficiency.)
(6) Remove any solder bridges with desoldering wire.
(7) Inspect the work with a magnifier.

2. Specification

2-1. General section

2-1-1. Power source ..... See Label Rating
2-1-2. Power consumption ..... 85 W
2-1-3. Dimension ..... 500 (W) x 255(H) x 215(D) mm

2-2. Amp section

2-2-1. Power output ..... 13 W/CH (6Ω)(10% DT)
2-2-2. Frequency response ..... 20 Hz~20 KHz
2-2-3. Signal to noise ratio ..... 80 dB
2-2-4. Channel separation ..... 65 dB
2-2-5. Input sensitivity ..... AUX 250 mV
MIC 2.5 mV

2-3. Tuner section

2-3-1. FM part

(1) Frequenty range ..... 87.5~108 MHz
(2) Usable sensitivity ..... 15 dB
(3) Signal to noise ratio ..... 55 dB
(4) Interference ratio ..... 40 dB
(5) Total harmonic distortion ..... 0.5 %
(6) Stereo separation ..... 35 dB

2-3-2. AM (MW) Part

(1) Frequency range ..... 522~1611 KHz
(2) Usable sensitivity ..... 54 dB
(3) Signal to noise ratio ..... 40 dB
(4) Interference ratio ..... 33 dB
(5) Total harmonic distortion ..... 2 %

2-3-3. LW (option) part

(1) Frequency range ..... 146 ~ 290 KHz
(2) Usable sensitivity ..... 60 dB
(3) S/N ratio ..... 33 dB

2-4. Deck section

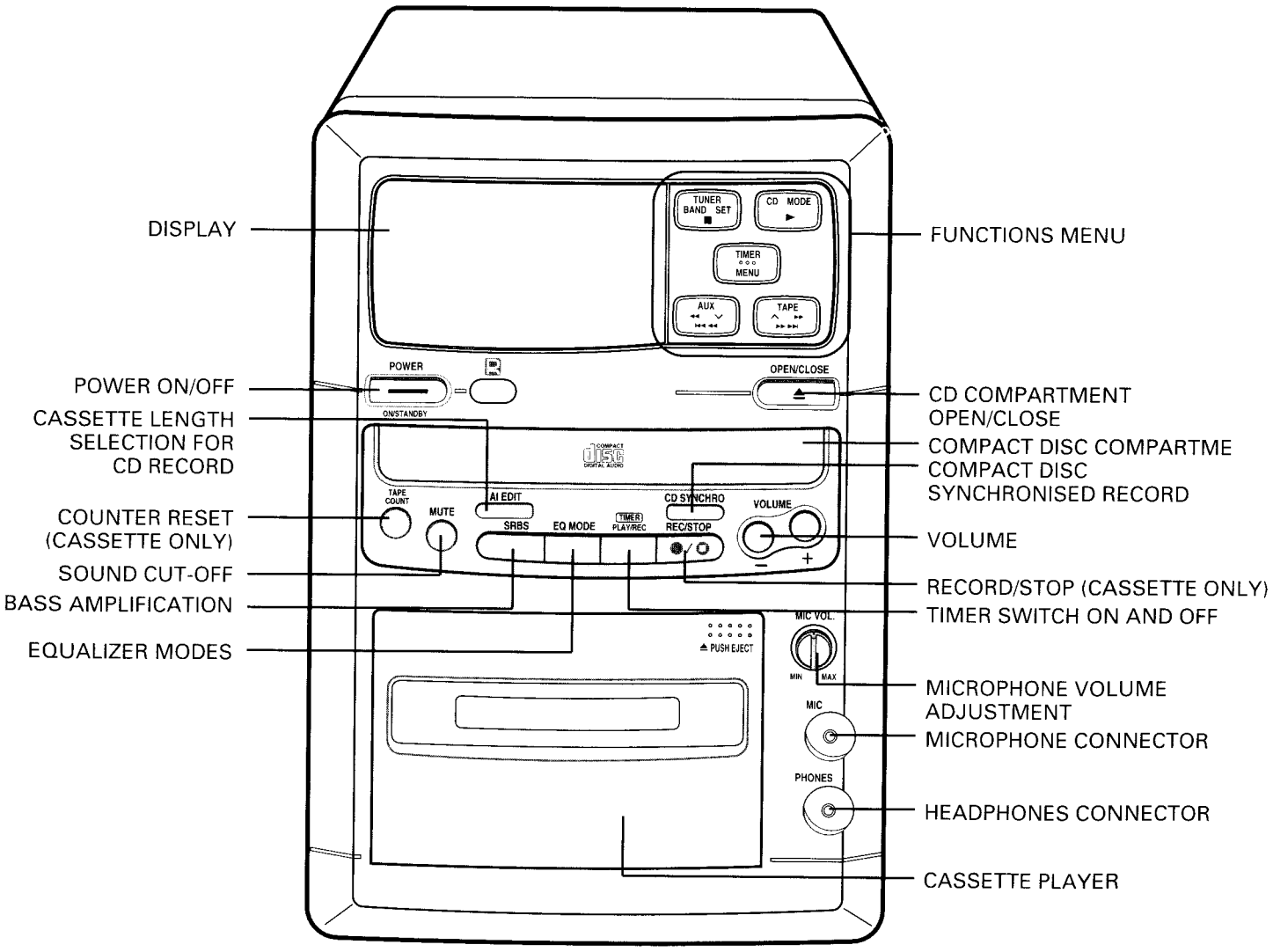
2-4-1. Frequency range ..... 125 Hz~8 KHz
2-4-2. WOW FLUTTER ..... 0.2 %
2-4-3. Erasing effect ..... 60 dB
2-4-4. Signal to noise ratio (Record/Play Mode) ..... 40 dB
2-4-5. F.F/Rewind time ..... About 120 second

2-5. CD section

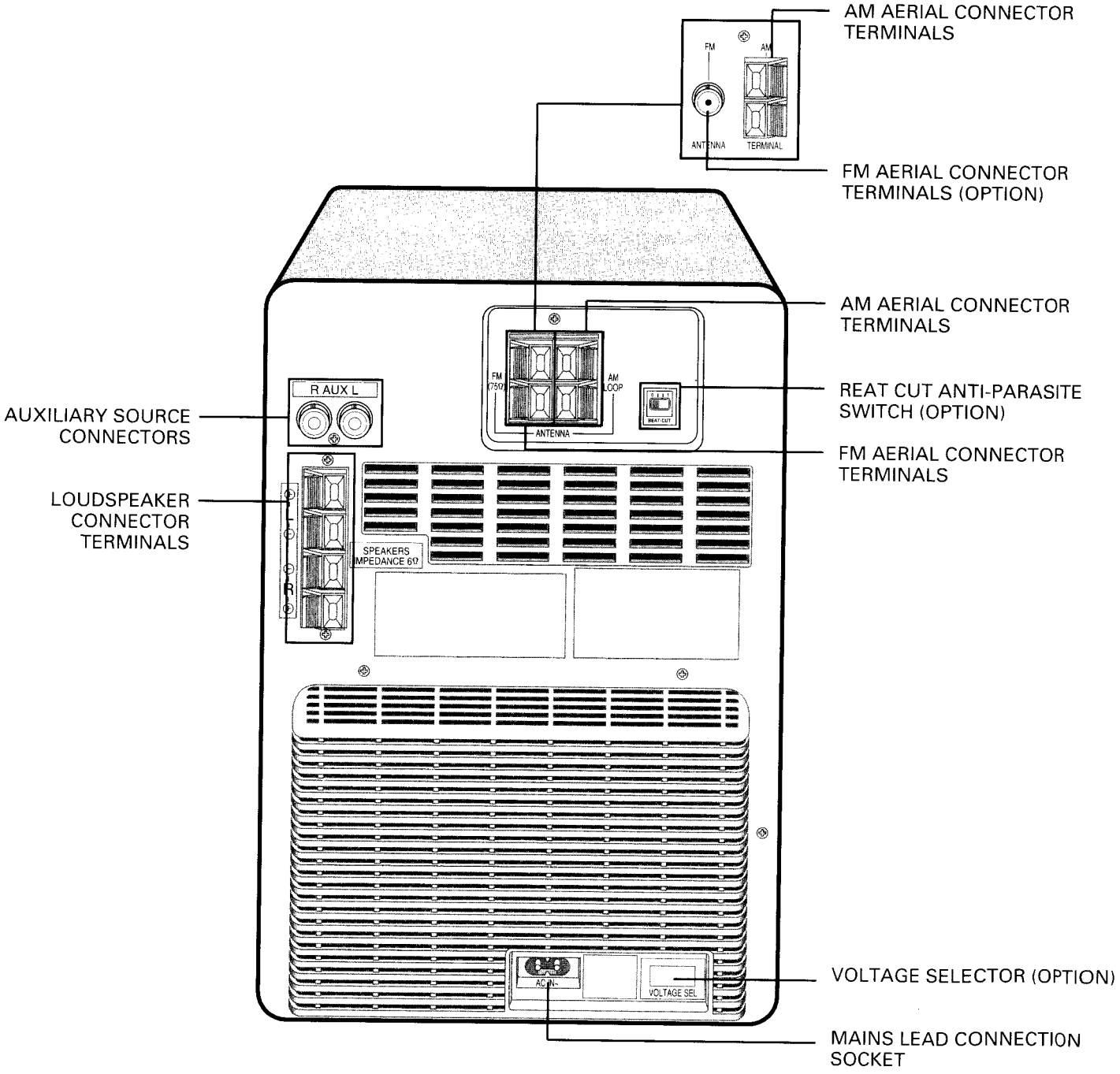
2-5-1. Frequency range ..... 20 Hz~20 KHz (± 1.5 dB)
2-5-2. Channel separation ..... 85 dB (1 KHz)
2-5-3. Total harmonic distortion ..... 0.05 %
2-5-4. Signal to noise ratio ..... 95 dB (1 KHz 0 dB)
2-5-5. D/A conversion ..... 8 over

3. Location of controls

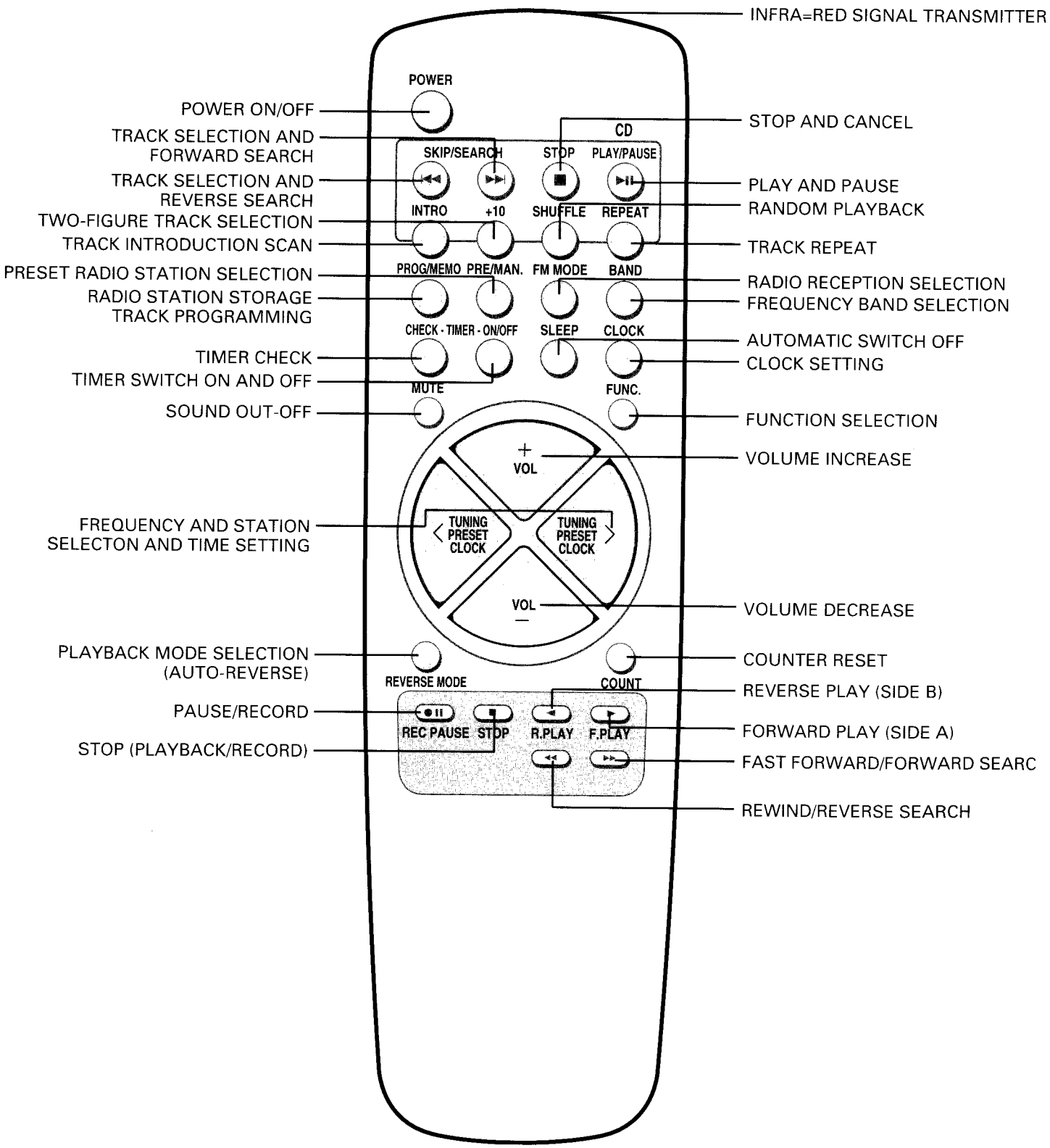
3-1. Front view



3-2. Rear view


AM AERIAL CONNECTOR TERMINALS
FM
AM
ANTENNA
TERMINAL
FM AERIAL CONNECTOR TERMINALS (OPTION)
AM AERIAL CONNECTOR TERMINALS
FM (75Ω)
AM LOOP
ANTENNA
REAT CUT ANTI-PARASITE SWITCH (OPTION)
REAT CUT
AUXILIARY SOURCE CONNECTORS
R AUX L
FM AERIAL CONNECTOR TERMINALS
LOUDSPEAKER CONNECTOR TERMINALS
SPEAKERS IMPEDANCE 6Ω
VOLTAGE SELECTOR (OPTION)
AC IN~
VOLTAGE SEL
MAINS LEAD CONNECTION SOCKET

3-3. Remote control



4. Disassembly instruction

Remove the plug from the well outlet before disassembling the unit

4-1. How to disassemble the rear of cabinet. (Fig. 1)

4-1-1. Remove nine screws of ① and eight of ② of its rear part.

4-1-2. Pull its rear part out backward horizontally as shown in the Fig. 1.

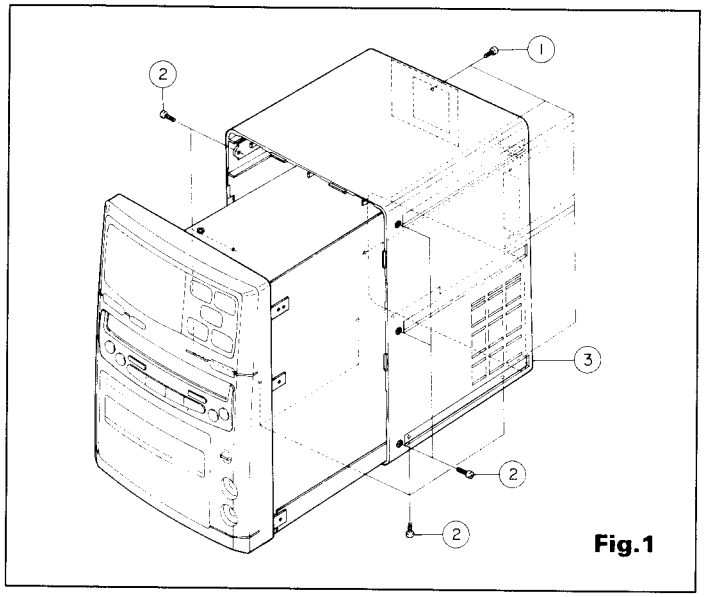


Fig.1

4-2. How to disassemble tuner PCB and Holder back. (Fig. 2)

4-2-1. Remove one screw of ① and then trun Tuner PCB of ② down aside a little to pull it out backward.

4-1-2. Remove one screw of ③ and then raise Holder back ④ upward to pull it out backward.

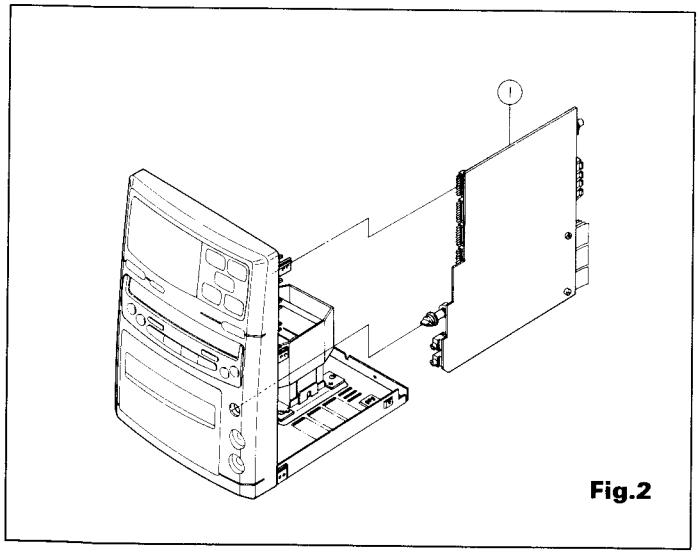


Fig.2

4-3. How to disassemble CD-Mecha (Fig. 3)

4-3-1. Pull its tray foreward and then raise its cover tray of ① upward to pull it out.

4-3-2. Remove one screw of ③ another one screw of ② and then pull CD-Mecha of ④ out.

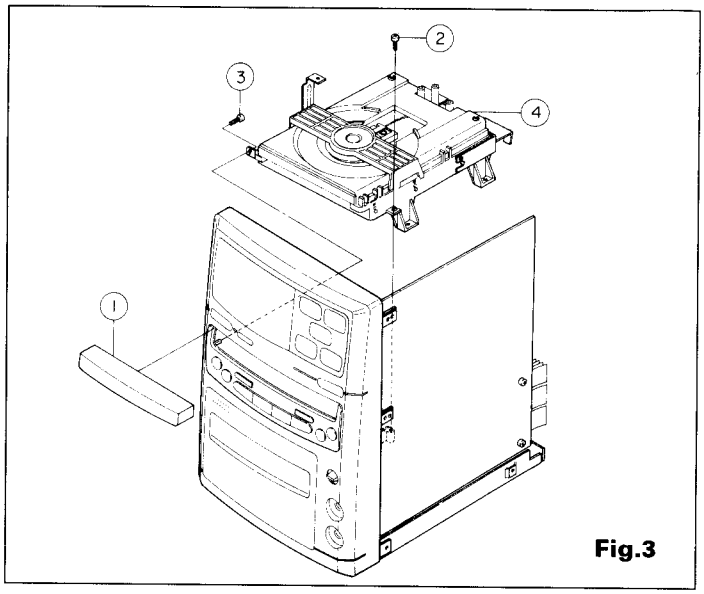


Fig.3

4-4. How to disassemble Main PCB (Fig. 4)

4-4-1. Pull Main PCB of ① backward horizontally to pull it out.

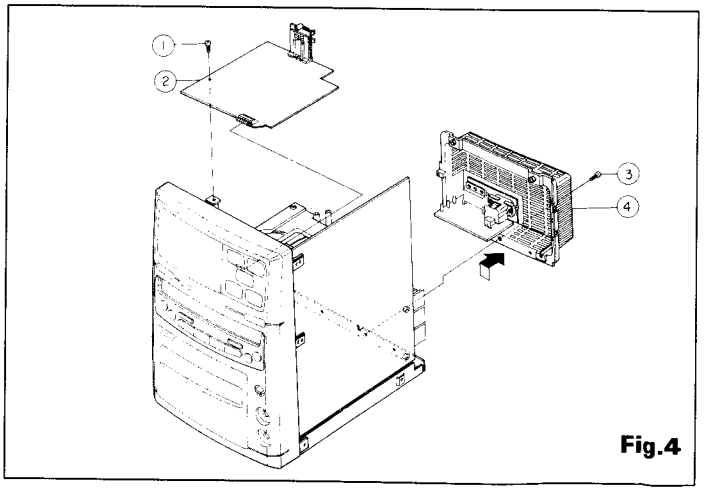


Fig.4

4-5. How to disassemble the front of cabinet. (Fig. 5)

4-5-1. Remove three screws of ① and then pull Cabinet bottom of ② out backward.

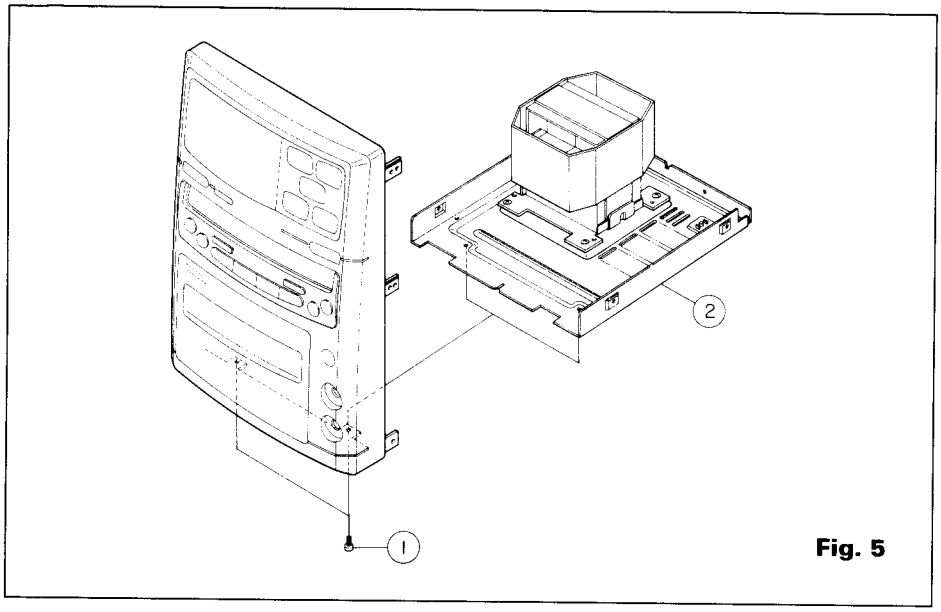


Fig. 5

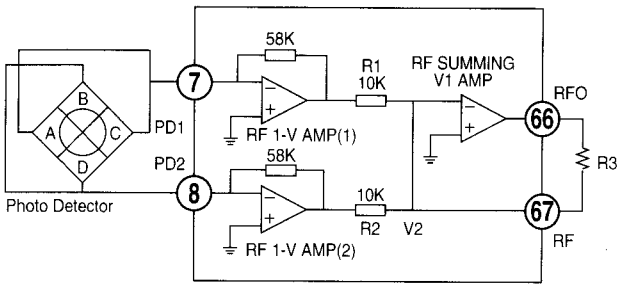
5. Basic circuit operation
5-1. μ-com

No.	PORT	Name	I / O	Function
1	P5 2	BGNS_RST	O	BGNS RESET
2	PWM1	VOL_ST	O	VOLUME IC STROBE
3	P2 0	OPEN S/W	I	CD DOOR OPEN S/W
4	1	CLOSE S/W	I	CD DOOR CLOSE S/W
5	2	OPEN MT	O	CD DOOR OPEN MOTOR
6	3	CLS MOT	O	CD DOOR CLOSE MOTOR
7	4	SENSE	I	CD SENSE
8	5	MUTE	O	CD/TUNER/TAPE MUTE
9	6	XLT	O	CD XLT
10	7	LD_XRST	O	CD LD/XRST CONTROL
11	TEST			
12	RES	RESET		
13	XT 1			
14	XT 2			
15	VSS	GND		
16	CF 1			8MHz
17	CF 2			8MHz
18	VDD			
19	P8 0	KEY 1	I	A/D KEY INPUT1
20	1	KEY 2	I	A/D KEY INPUT2
21	2	EQ R	I	EQ LEVEL INPUT (RIGHT)
22	3	EQ L	I	EQ LEVEL INPUT (LEFT)
23	4	AMPS IN	I	TAPE AMPS SIGNAL IN
24	5	TUN_OPT	I	TUNER A/D OPTION
25	6	HALL	I	TAPE HALL SIGNAL IN
26	7	GFS	I	CD GFS
27	P7 0	SCOR	I	CD SCOR INTERRUPT
28	1	INH	I	POWER CORD CHECK
29	2	FOK	I	CD FOCUS OK
30	3	REMOCON	I	REMOCON PULSE IN
31	S 1	GRID 1		
32	2	2		
33	3	3		
34	4	4		
35	5	5		
36	6	6		
37	7	7		
38	8	8		
39	9	9		
40	10	10		
41	11	11		
42	12	12		
43	13	13		
44	14	14		
45	15	15		
46	16			
47	VDP			
48	VP			
49	S 1	SEG 1		
50	S 2	SEG 2		

No.	PORT		Name	I / O	Function
51	SEG	14	SEG 3		
52		13	4		
53		12	5		
54		11	6		
55		10	7		
56		9	8		
57		8	9		
58		10	10		
59		11	11		
60		12	12		
61		13	13		
62		14	14		
63		15	15		
64		16	16.		
65	P0	0	Q3(C)		
66		1	Q2(B)		
67		2	Q1(A)		
68		3	Q4(DATA)		
69		4	G1 (SEL1)		
70		5	G2 (SEL2)		EXPAND IC CONTROL
71		6	PWR_SNS	O	POWER SENSE
72		7	BGNS_CH	O	BGNS CHANNEL SELECT
73	P1	0	BGS_CLK	O	BGS CLOCK
74		1	SUBQ	I	SUBQ
75		2	CLKSQCK	O	CLOCK/SQCK
76		3	DATA	O	CD SUBQ DATA
77		4	STEREO	I	STEREO CHECK
78		5	SD	I	
79		6	MO/ST	O	MONO/STEREO
80		7	STOUT	I	
81	P3	0	TUN_DAT	O	TUNER DATA
82		1	TUN_CLK	O	TUNER CLOCK
83		2	TUN_CE	O	TUNER CE
84		3	STRQ	O	
85		4	REC	O	TAPE RECORD
86		5	MOTOR	O	TAPE MOTOR
87		6	SOL	O	TAPE SOLENOID ON/OFF
88		7	PLAY	O	TAPE PLAY
89	VSS				
90	VDD				
91	P4	0	REC_MUT	O	TAPE RECORD MUTE
92		1	BGNS_MUT	O	BGNS MUTE ON/OFF
93		2	BGNS_NAR	I	BGNS NAR
94		3	R_REC	I	R REC PROTECT (L)
95		4	MODE	I	DECK MECHA ,Mode(L)
96		5	HALF	I	TAPE existence or nonexistence (L)
97		6	F_REC	I	F REC PROTECT (L)
98		7	CD_HIGH	O	CD HIGH SPEED (H)
99	P5	0	BGNS_ST	O	BGNS STROBE
100		1	BGNS_DAT	O	BGNS DATA

5-2. CD section

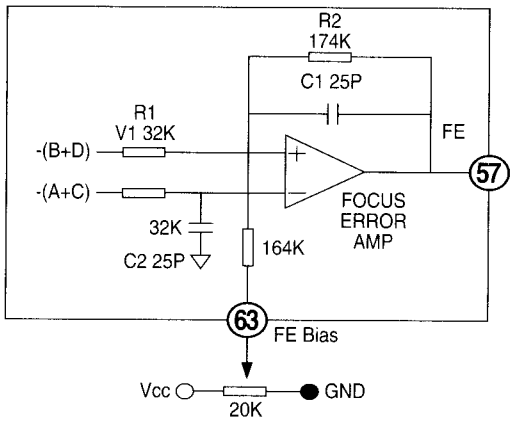
1) RF Amp(KA9220) : NIC9220



RF I-V Amp(1) and RF I-V Amp (2) are converted to voltage via internal resistance of 58kΩ from the current of PD1(A+C) and PD2 (B+D) ; then, this voltage is added to RF summing amplifier. The signal (A+B+C+D) is applied to RFO (No.2 terminal). RF output voltage can be calculated as follows:

VRF = -R3 x (iPD1 + iPD2)
=-R3 x (V1/R1 + V2/R2)
=-R3 x (V1/10K + V2/10K)
=-R3/10K x (V1 + V2)

2) FOCUS ERROR Amp(KA9220) : NIC9220



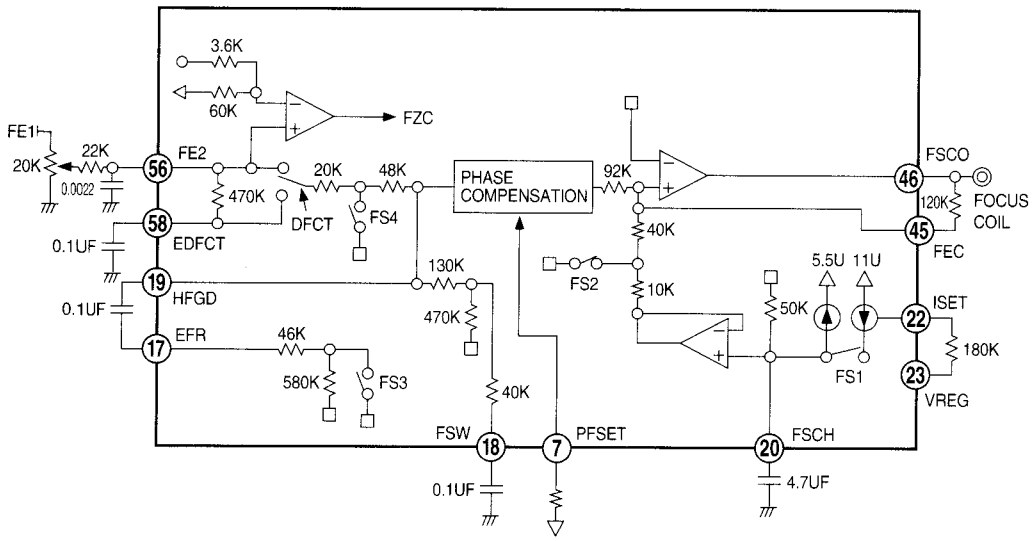
FOCUS ERROR Amp is the circuit which amplifies the difference between RF I-V Amp(1) output(A+C) and RF I-V Amp(2) output (B+D).
These two signals are supplied to (-) and (+) input terminals of FOCUS ERROR Amp. The FOCUS ERROR signal resulting from this difference voltage is applied to FE (Terminal No. 57). The FE output voltage of this low frequency component varies depending on { (A+C) - (B+D) }. VFE can be obtained as follows.

VFE = (R2/R1) x (V2-V1) = 5.4(V2-V1)

This FOCUS ERROR voltage is sent to FOCUS SERVO circuit to maintain optimum focusing.

3) FOCUS SERVO SYSTEM(KA9220) : NIC9220

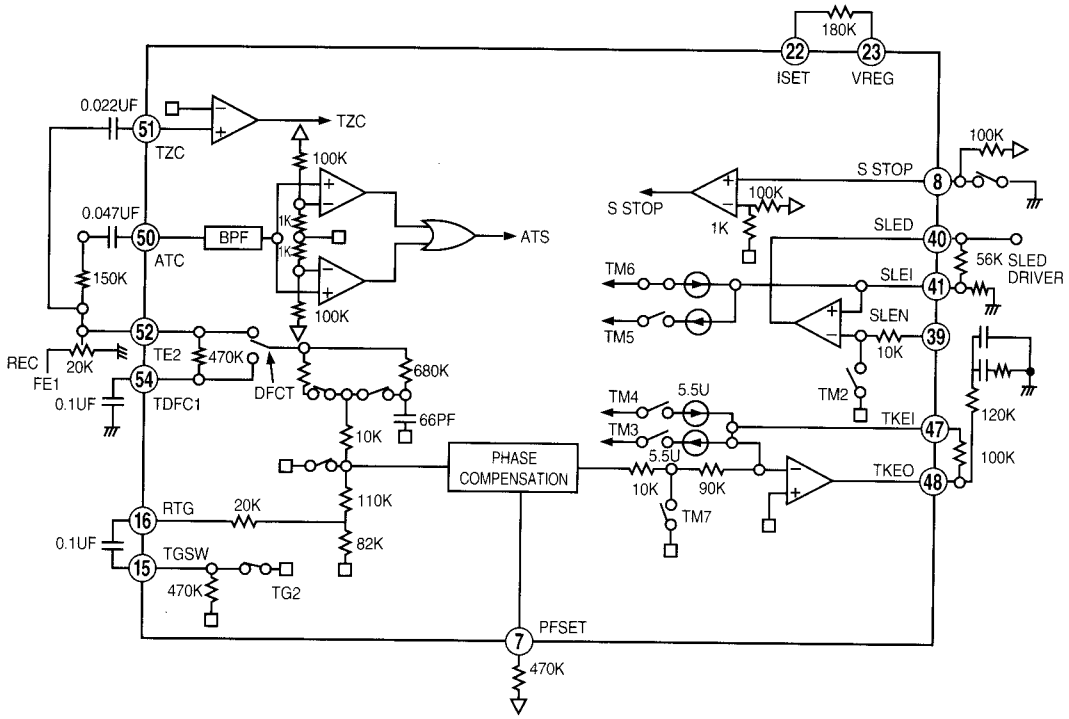
The diagram of Focus Servo System is shown in the following.
When FS3 is ON, high frequency gain decreases in the form of low frequency time constant by pin 17, pin 19, and capacitor connected to internal resistance.
The capacitor between pin18 and GND has the time constant picking up the low frequency operated in PLAY mode.



The maximum frequency of focus phase compensation is inversely proportional to the resistance connected to pin7.
Focus search peak is about 1.1 Vp-p, and is inversely proportional to the resistance connected to pin22,23 ; however, if this resistance changes, the peak of track jump and sled kick changes.
The inversion input of FZC comparator is set to 5.7% of the difference between Vcc and VC(pin69) { 5.7% x (Vcc -VC) }.
Note: If the resistance connected to pin 7 changes, the phase compensation peak of focus, tracking, sled servo changes. At the same time, 'op-amp' dynamic range and offset voltage also change.

4) TRACKING SLED SERVO SYSTEM(KA9220) : NIC9220

The diagram of Tracking Sled Servo System is shown in the following. The capacitor between pin15 and 16 has a time constant, and lowers the high frequency when TG2 is off. The maximum frequency of tracking phase compensation is inversely proportional to the resistance connected to pin7(about 1.2KHz at 470K). The tracking jump in the direction of FWD and REV is decided when TM3 and TM4 are ON, and the peak voltage induced from tracking coil is decided by the both TM3 and TM4 current values, and feed back resistance of pin47.
Track jump max. Voltage= TM3(TM4) current x feedback resistance.



FWD or REV sled kick is carried out when TM5 of TM6 is ON , and the peak voltage added to sled motor is decided by TM5 or TM current and the feedback resistance of pin no. 41.
Sled jump max. voltage = TM5(TM6) current x feedback resistance.
Each SW current is decided by the resistance connected to pin no.22 and 23.
When the resistance is about 150kΩ.

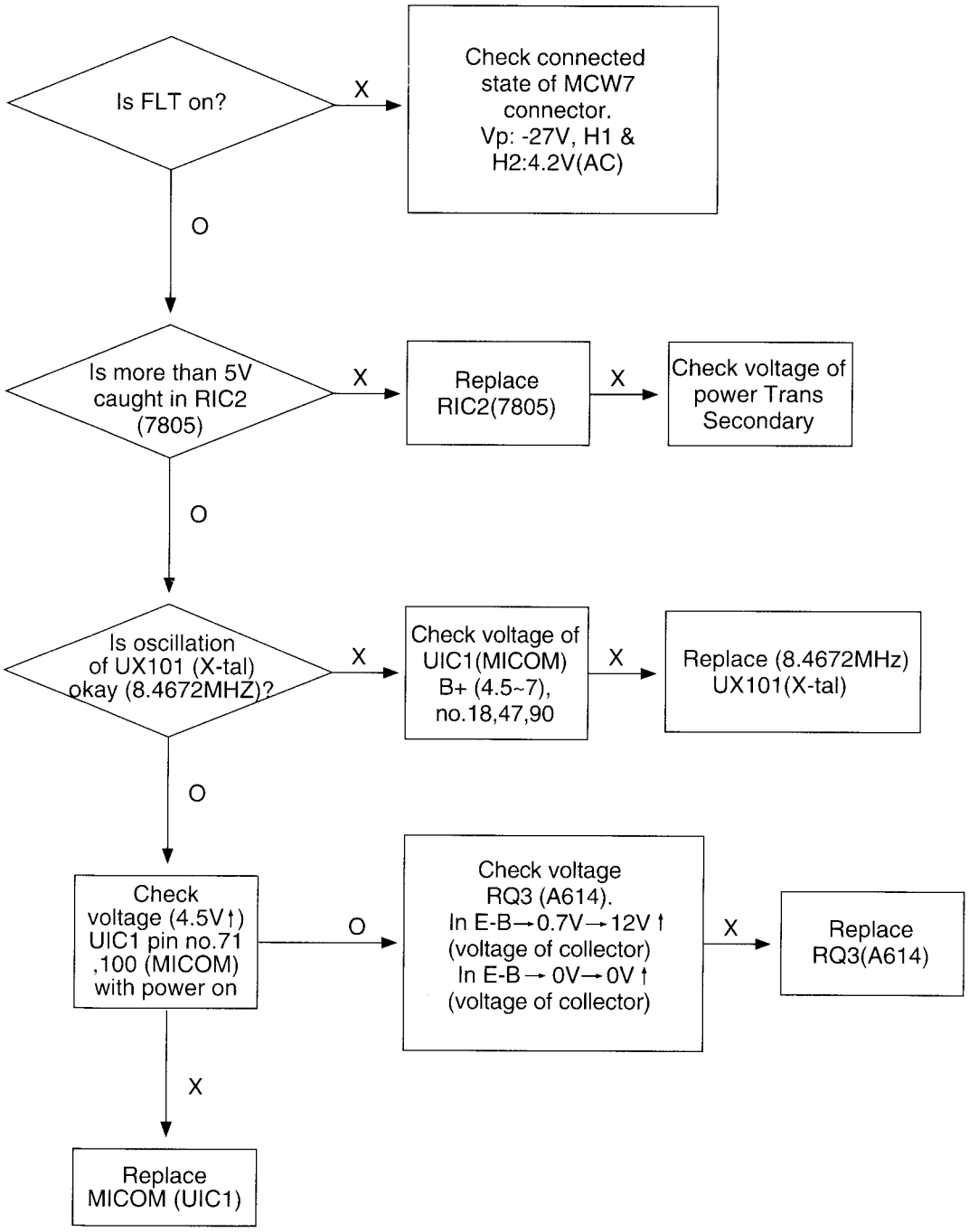
TM3 or TM4 = 11μA ;
TM5 or TM6 = 22μA.

This current is value is almost inversely proportional to the resistor, variable within a range of about 5 to 40μA for TM3.
STOP is the ON/OFF detection signal for the limit SW or the sled motor's innermost circumference.

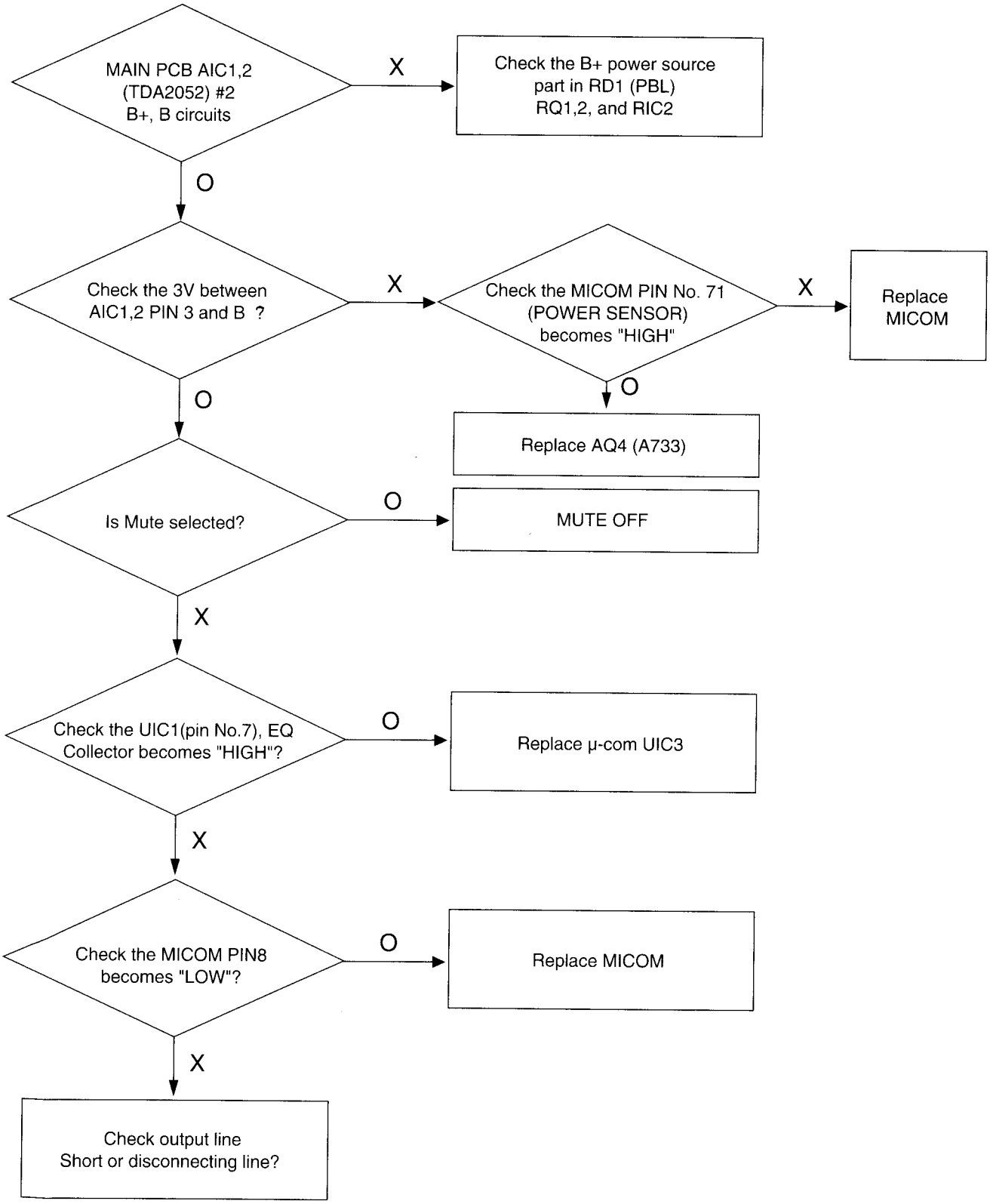
6. Trouble shooting

6-1. The Amplifier section

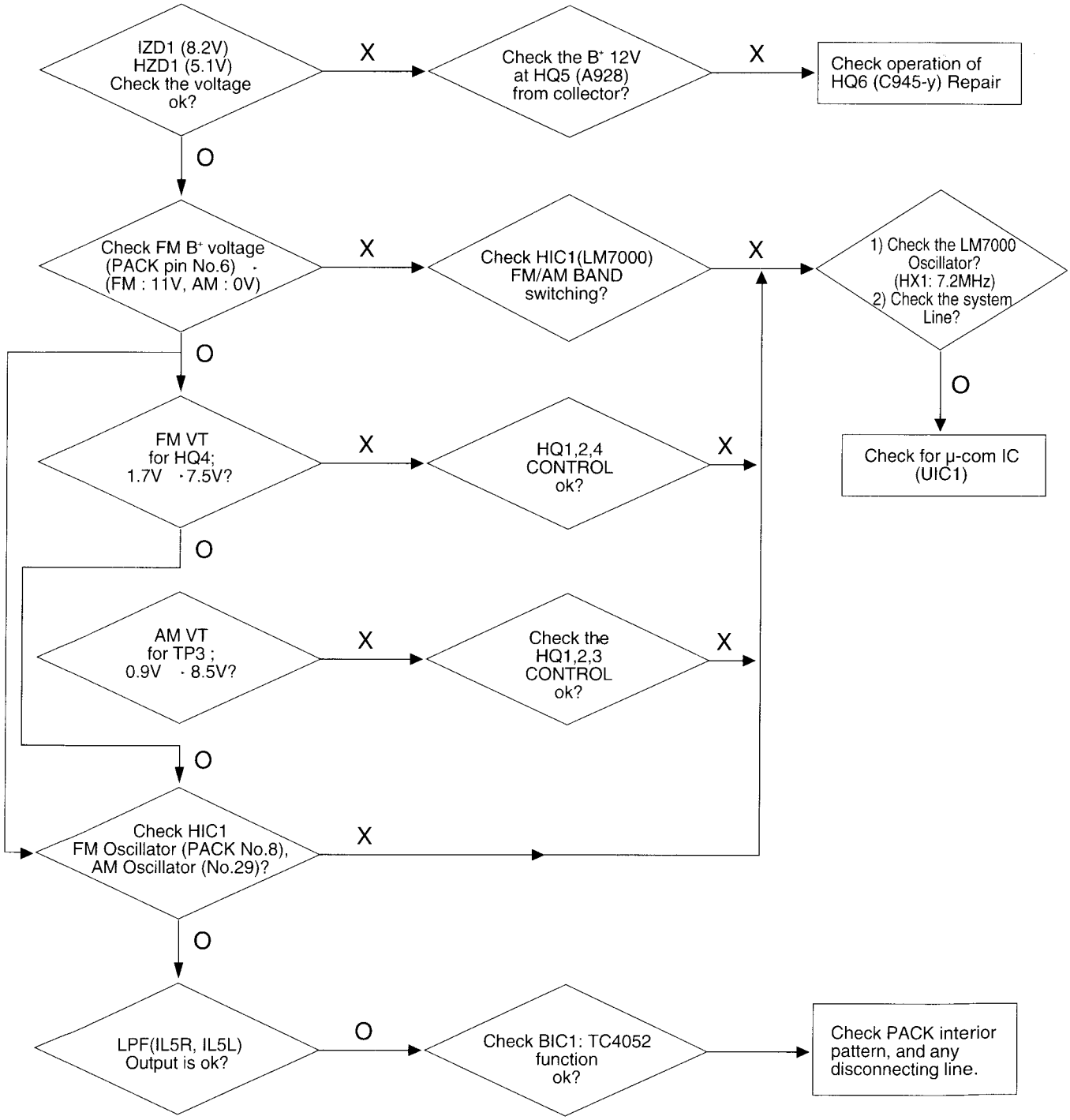
6-1-1. Power malfunction



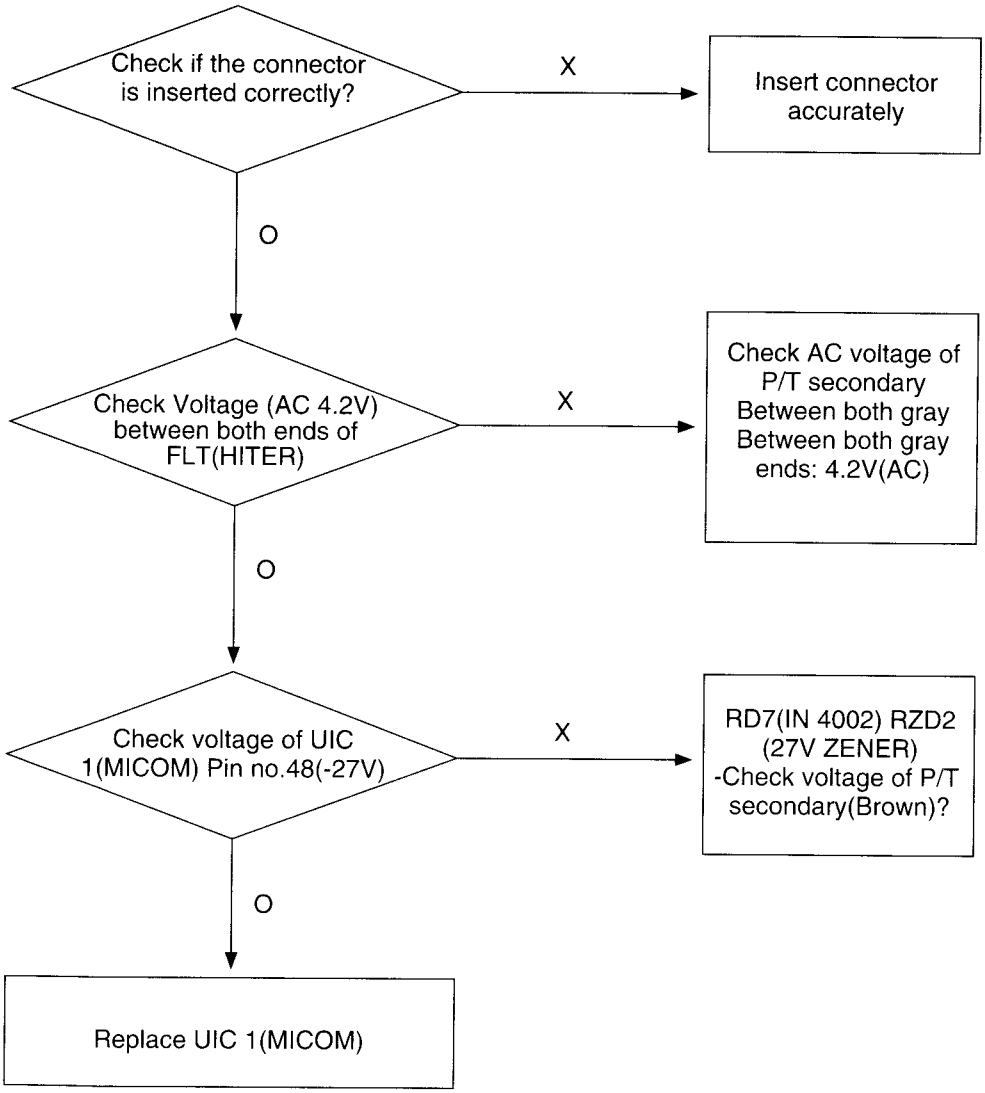
6-1-2. No output



6-1-3. Tuner malfunction(FM/AM)

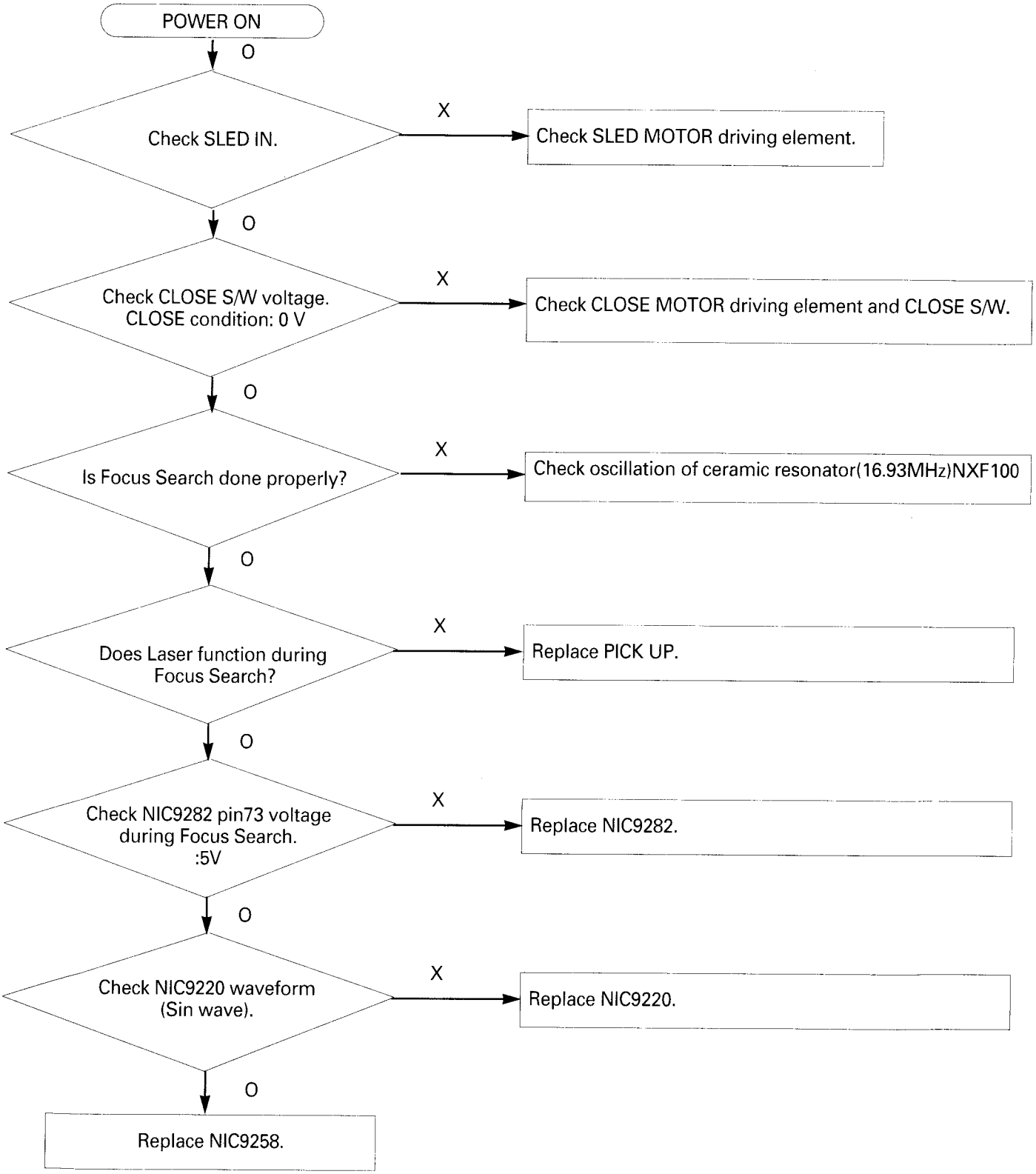


6-1-4. FLT section

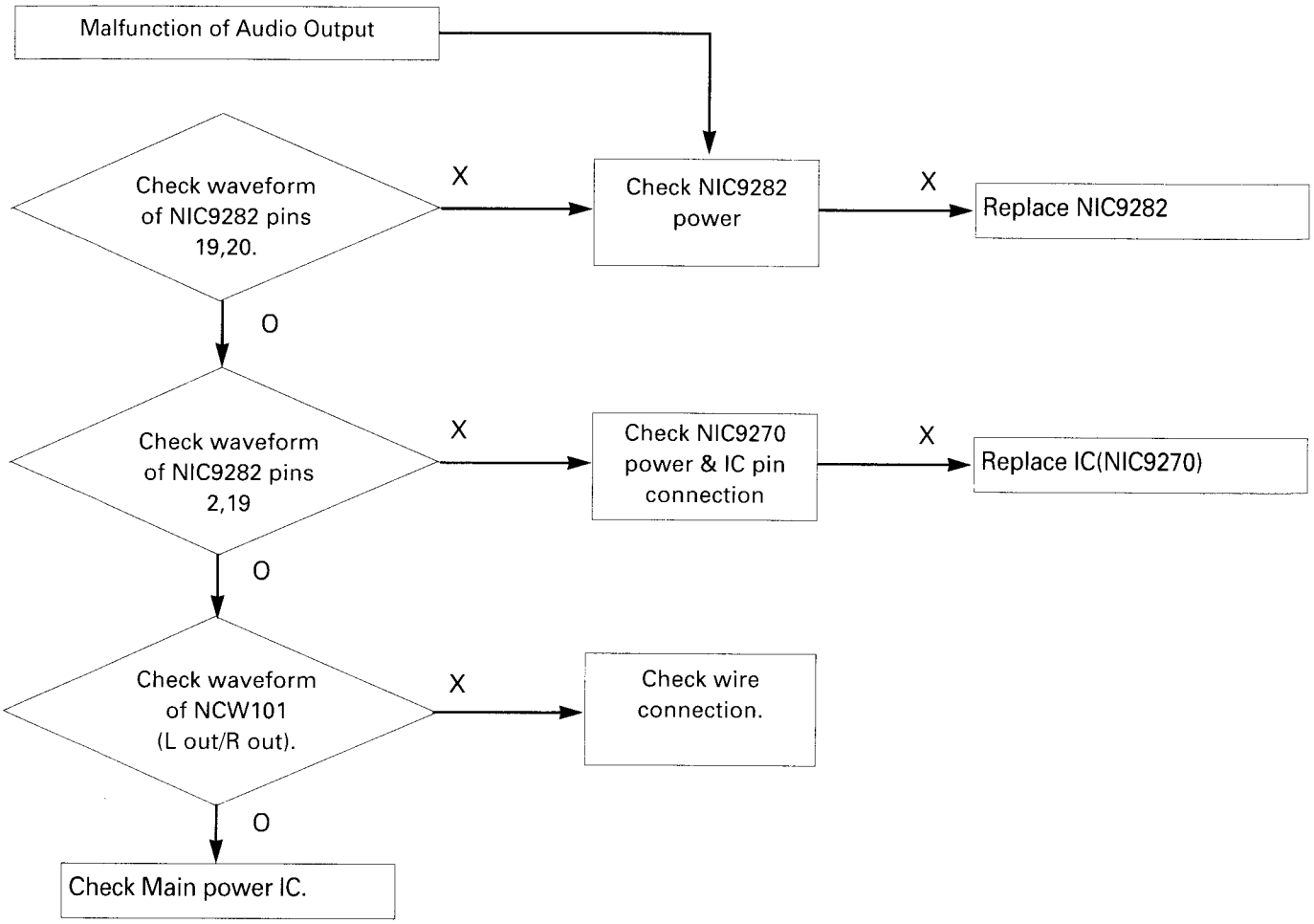

Check if the connector is inserted correctly?
X
Insert connector accurately
O
Check Voltage (AC 4.2V) between both ends of FLT(HITER)
X
Check AC voltage of P/T secondary Between both gray Between both gray ends: 4.2V(AC)
O
Check voltage of UIC 1(MICOM) Pin no.48(-27V)
X
RD7(IN 4002) RZD2 (27V ZENER) -Check voltage of P/T secondary(Brown)?
O
Replace UIC 1(MICOM)

6-2. CD section

6-2-1.Malfunction of DISC Revolution



6-2-2. Malfunction of audio output



6-3. Cassette deck section

6-3-1. Troubleshooting chart

<table>
<tr><th>BLOCK</th><th>MAIN FUNCTION</th><th>CHECK POINT</th></tr>
<tr><td>TAPE IC
(JIC1 : KA22291)</td><td>● Convert of P/B & R/P SIGNAL
& Deck output IC.</td><td>● Check for voltage at Pin no. 5
P/B mode ; H
R/P mode ; L</td></tr>
<tr><td>BIAS OSC</td><td>● Oscillate RECORD BIAS
(85KHz)</td><td>● JL2 CHECK
Osc. Frequency ; 85KHz
● When inoperative ; JQ5,6,7 check</td></tr>
<tr><td>R/P SWITCHING</td><td>● Convert PLAY/RECORD</td><td>● Check for voltage at Pin no. 16, 8
<table><tr><th>Mode</th><th>Pin no. 16,8</th></tr><tr><td>REC.</td><td>9V</td></tr><tr><td>PLAY</td><td>0V</td></tr></table></td></tr>
<tr><td>AMPS
JIC2(LA2010)</td><td>● AMPS(AUTO MUSIC PROGRAM
SEARCH) function</td><td>● Check for pin no. 6
When between songs : Low(Normal)
When playing sons : High(Noramal)
● When inoperative ; Check the signal
input of pin no.1</td></tr>
</table>

7. Adjustment

Adjustments to this unit have already been made during production procedure.
Therefore, no adjustment is needed. If parts related to the adjustment are replaced, or readjustment is required, proceed with adjustments in the order given below.

7-1. Tuner section

7-1-1. Measuring instruments required

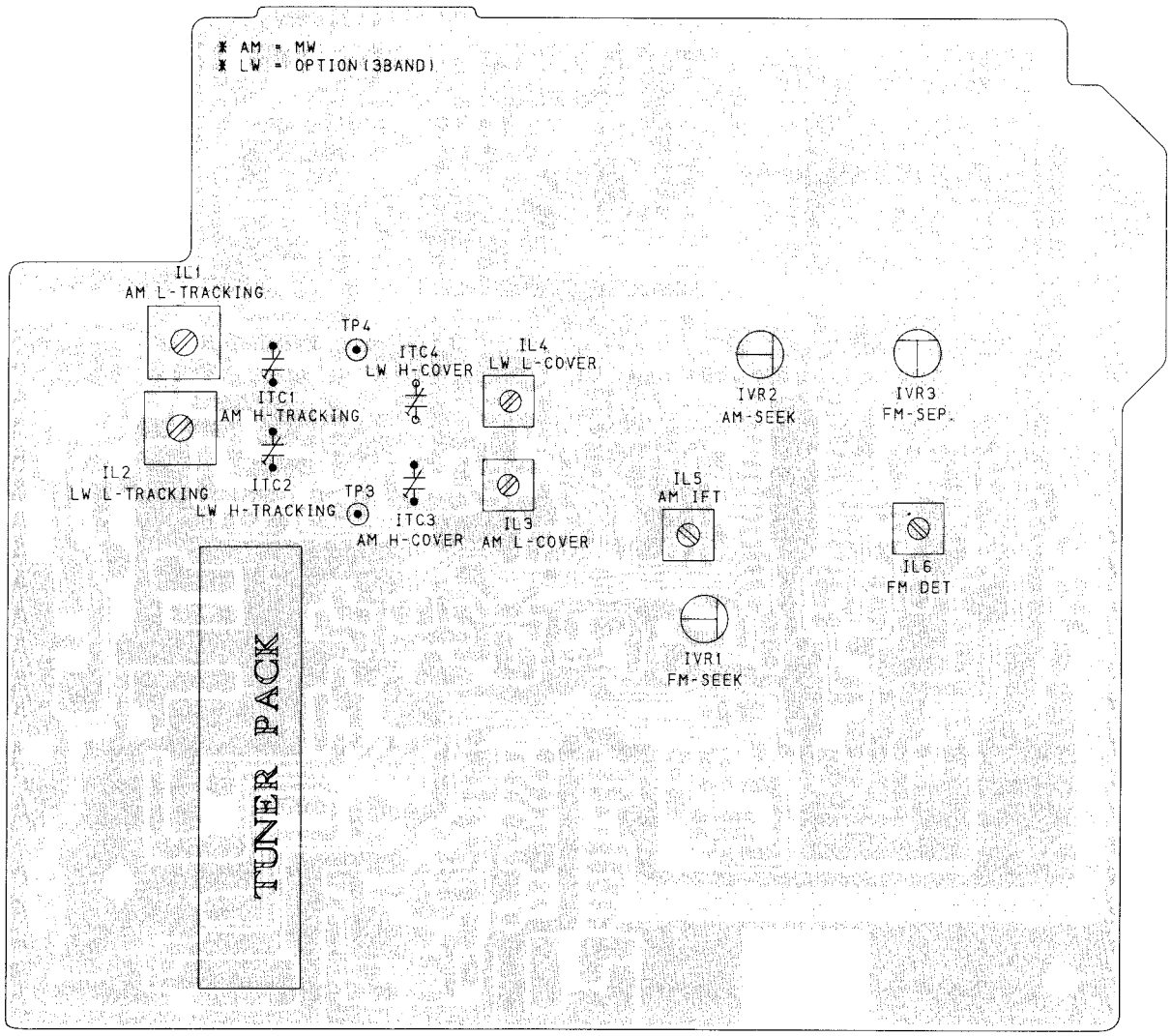
(1) AM standard signal generator (S.S.G) : 400Hz, 30% MOD.
(2) FM standard signal generator : output impedance 75Ω, or 300Ω dummy 1KHz, 40KHz DEV.
(3) Oscilloscope
(4) VTVM
(5) AM Loop antenna
(6) Frequency Counter
(7) Dummy load(6Ω)
(8) DC voltmeter

7-1-2. Importants

(1) Check the power source first.
(2) Check function and band switch.
(3) The equalizer, volume and balance control should be turned to the mid position.

7-1-3. Location of adjustment points (parts side)

TUNER PCB

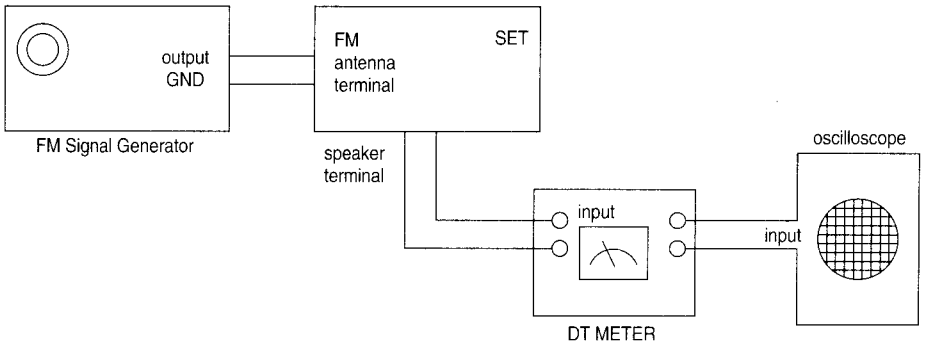


1. Adjustment procedure

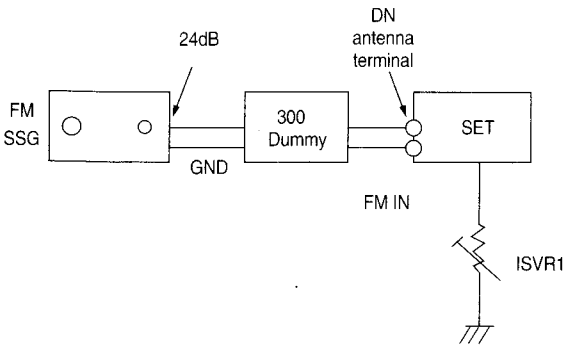
(1) FM Adjustment

STEP	ITEM	CONTECTION	SSG FREQ.	FREQ. SETTING	ADJUSTMENT POINT	RESULT & REMARK
1	IF center & T.H.D	FIG. 1	98MHz 60dB	98MHz	IL6	Distortion (DT) Minimum(DT 0.4% ↓)
2	Auto selection level	FIG. 2	98MHz 24dB	98MHz	IVR1	"QUARTS LOCK" is shown on FLT
3	FM stereo seperation	FIG. 3	98MHz 60dB	98MHz	IVR3	If L-CH is input, R-CH should be minimum and visa-versa.

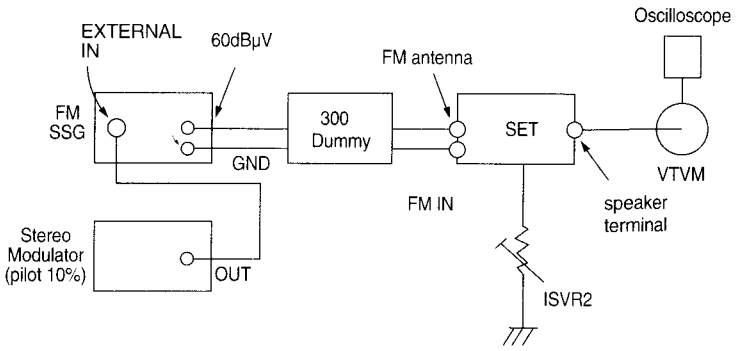
NHigh coverage and tracking adjustment are not required



(FIG. 1) IF CENTER AND T.H.D



(FIG. 2) FM AUTO SEARCH LEVEL



(FIG. 3) FM STEREO SEPERATION

RFIG. 2,3 : 300 dummy-optional

(2) AM-Adjustment

① 2BAND (FM/AM)

STEP	ITEM	CONTECTION	SSG FREQ.	FREQ. SETTING	ADJUSTMENT POINT	RESULT & REMARK
1	Intermidiate frequency (IF) adjustment	connect DC voltmeter to TP3(+), TP4(-).	450KHz	522KHz	IL5	Maximum output
2	AM trequency coverage adjustment	connect DC voltmeter to GND.	—	522KHz	IL3	0.9V
3			—	1611KHz	ITC3	D8.5V
4	Repeat step 2 and 3 several times.					
5	AM tracking adjustment	FIG. 4	594KHz	594KHz	IL1	Maximum output
6			1404KHz	1404KHz	ITC1	
7	Repeat step 5 and 6 several times.					
8		FIG. 4	999KHz 58dB	999KHz	IVR2	"QUARTZ LOCK" is shown on F.L. T.

② 3 BAND (FM/MW/LW) * MW band : Refer to 2 band section.

STEP	ITEM	CONTECTION	SSG FREQ.	FREQ. SETTING	ADJUSTMENT POINT	RESULT & REMARK
1	LW frequency coverage adjustment	FIG.4	-	146KHZ	IL4	1.1V
2			-	290KHZ	ITC4	5.0V
3	Repeat step 1 and 2					
4	LW tracking adjustment	FIG.4	170KHZ	170KHZ	IL2	Maximum output
5			270KHZ	270KHZ	ITC2	Maximum output
6	Repeat step 4 and 5.					

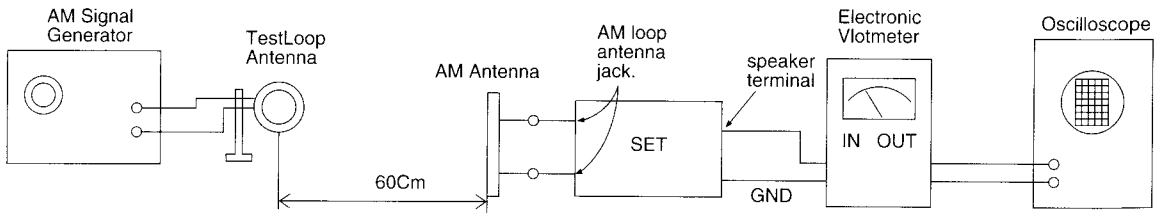


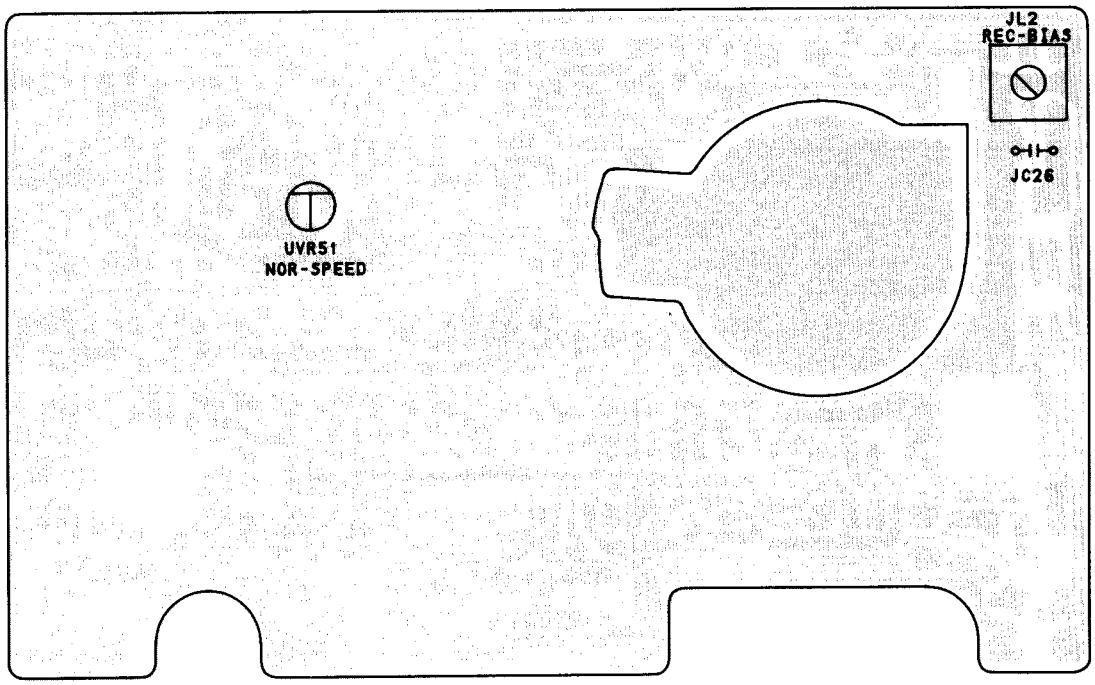
FIG. 4

7-2. TAPE

7-2-1. Measuring instruments required

(1) Oscilloscope
(2) VTVM
(3) TAPE
  ① MTT-111 (or equivalent) : 3KHz signal is recorded → tape speed
  ② MTT-5512 (or equivalent): No signal test tape
  ③ MTT-113CN (or equivalent) : 8KHz signal is recorded. → Azimuth

7-2-2. Location of adjustment points (parts side)



7-2-3. Adjustment procedure

(1) Tape speed

Step	Item	Contection	Preparation	Adjustment point	Result & Remark
	Normal speed adjustment	FIG. 1	Insert MTT-111 to DECK. Press PLAY button	UVR51	3 KHz

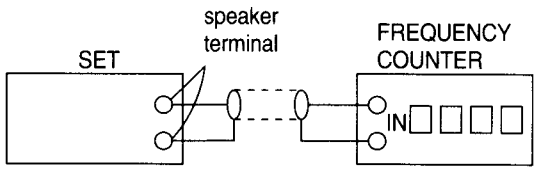


FIG. 1

(2) AZIMUTH

Deck

STEP	ITEM	CONTECTION	PREPARATION	ADJUSTMENT POINT	RESULT & REMARK
1	AZIMUTH	FIG. 2	Play MTT 113CN in the DECK .	FIG. 3	Maximum output and same phase of L, R-CH. Fix the screw.

② Record frequency

STEP	ITEM	CONTECTION	PREPARATION	ADJUSTMENT POINT	RESULT & REMARK
1	BIAS OSC. Frequency	-	Push REC switch MTT-5512 in the DECK .	JL2	85kHz(JC26) Both ends

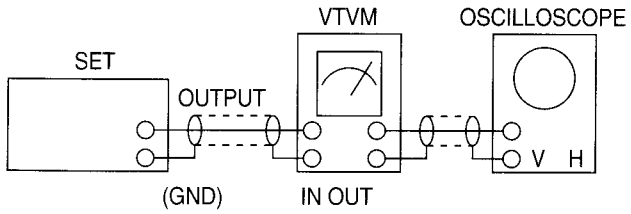


FIG. 2

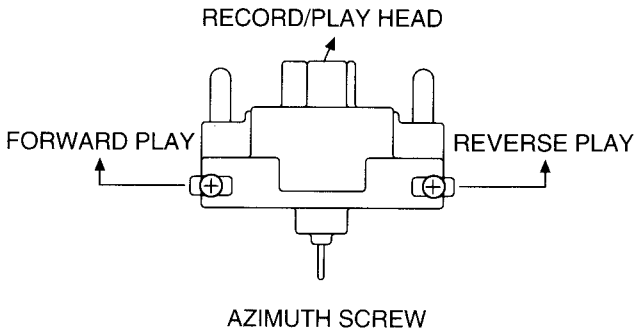
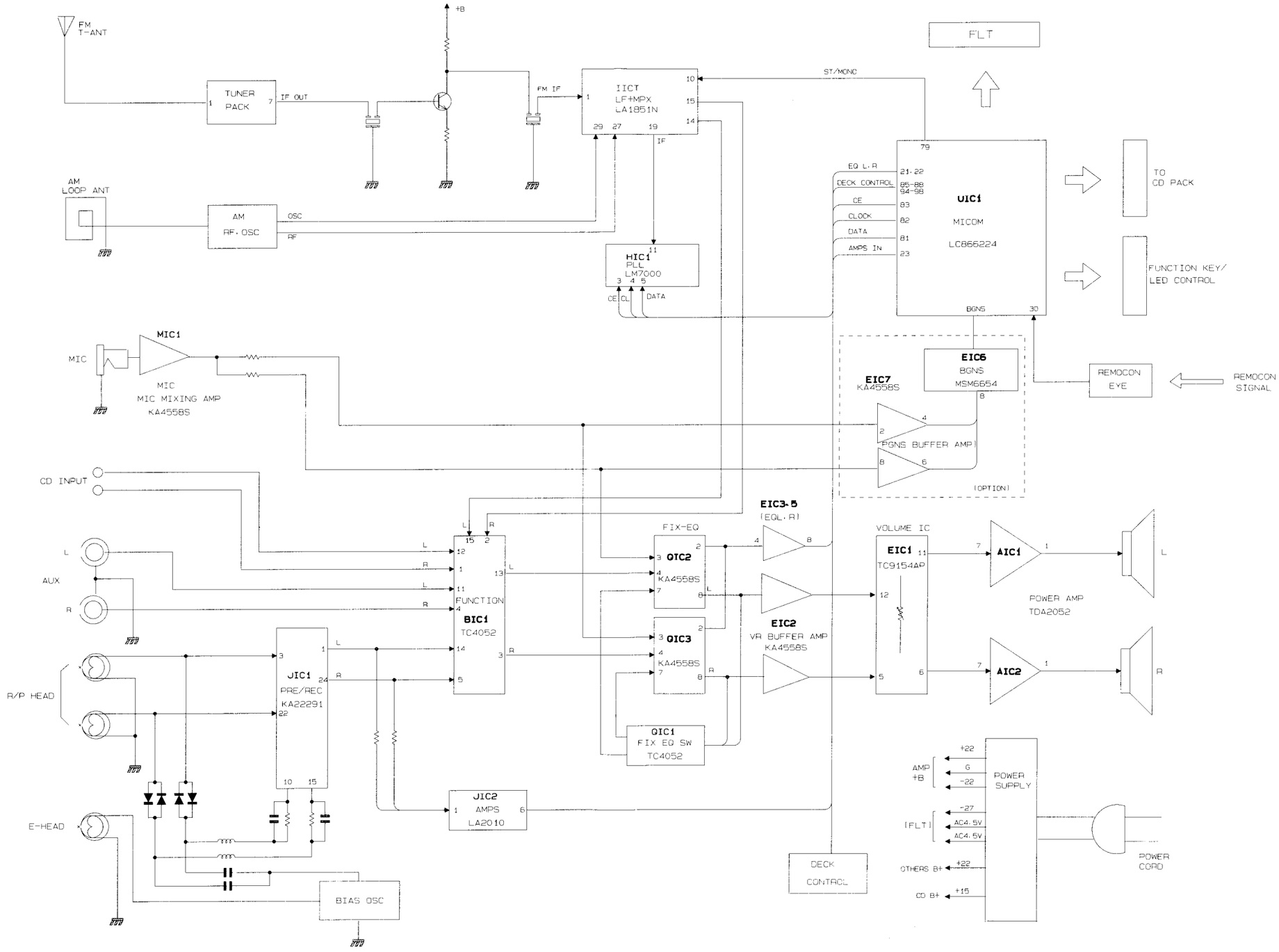


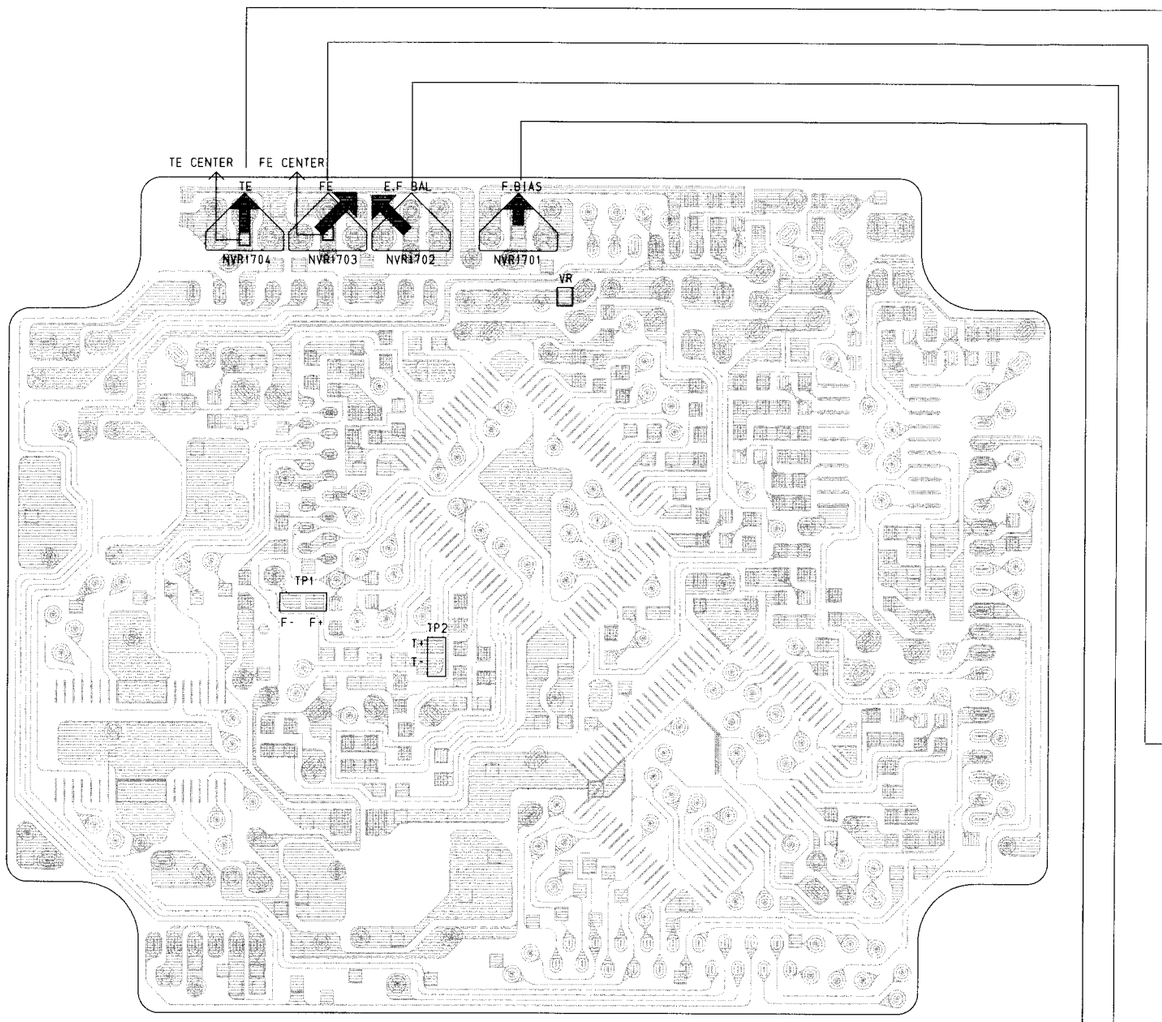
FIG. 3

8. Block diagram

8-1. Main section



7-3. CD section



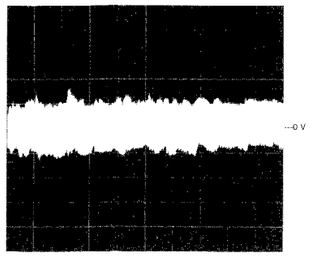
7-3-1. To Adjust FOCUS BIAS (STOP mode)

1) Set Volt/Div of the oscilloscope at DC 100mV.
2) In GND condition of the oscilloscope, set the wave form at 0V, and then set it in the DC range.
3) Connect the GND disconnector of the oscilloscope at VR, and (+) disconnector to center of NVR1703.
4) By using NVR1701 set it at 0mV.

7-3-2. To adjust tracking gain (PLAY mode)

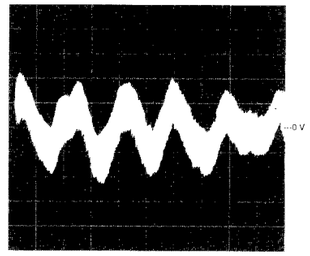
1) Connect;GND disconnector of the oscilloscope to VR and (+)disconnector toTP2.
2) Load and play the disc.
3) While the disc is running adjust the gain with NVR1704 as shown in the following figure.

(Normal freqency)



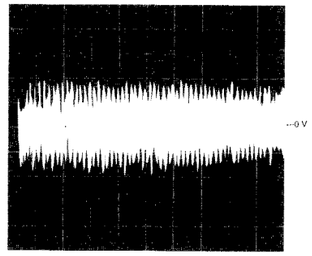
VOLT/DIV: 0.2V
TIME/DIV: 2mS

(Low frequency)



VOLT/DIV: 0.2V
TIME/DIV: 2mS

(High frequency)

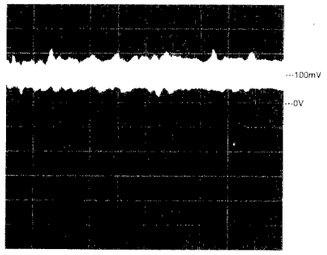


VOLT/DIV:0.2V
TIME/DIV:2mS

7-3-3. To Adjust Focus gain (PLAY mode)

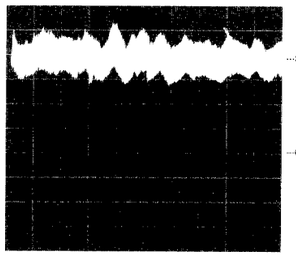
1) Connect;GND disconnector of the oscilloscope to VR and (+)disconnector to TP1.
2) Load and play the disc.
3) While the disc is running adjust the gain with NVR1703 as shown in the following figure.

(Normal freqency)



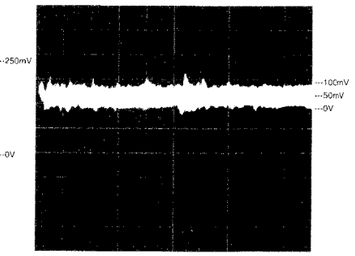
VOLT/DIV: 0V
TIME/DIV: 2mS

(Low frequency)



VOLT/DIV: 0.1V
TIME/DIV: 2mS

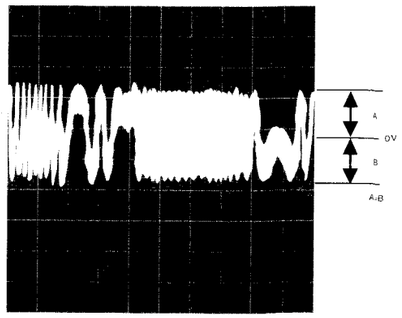
(High frequency)



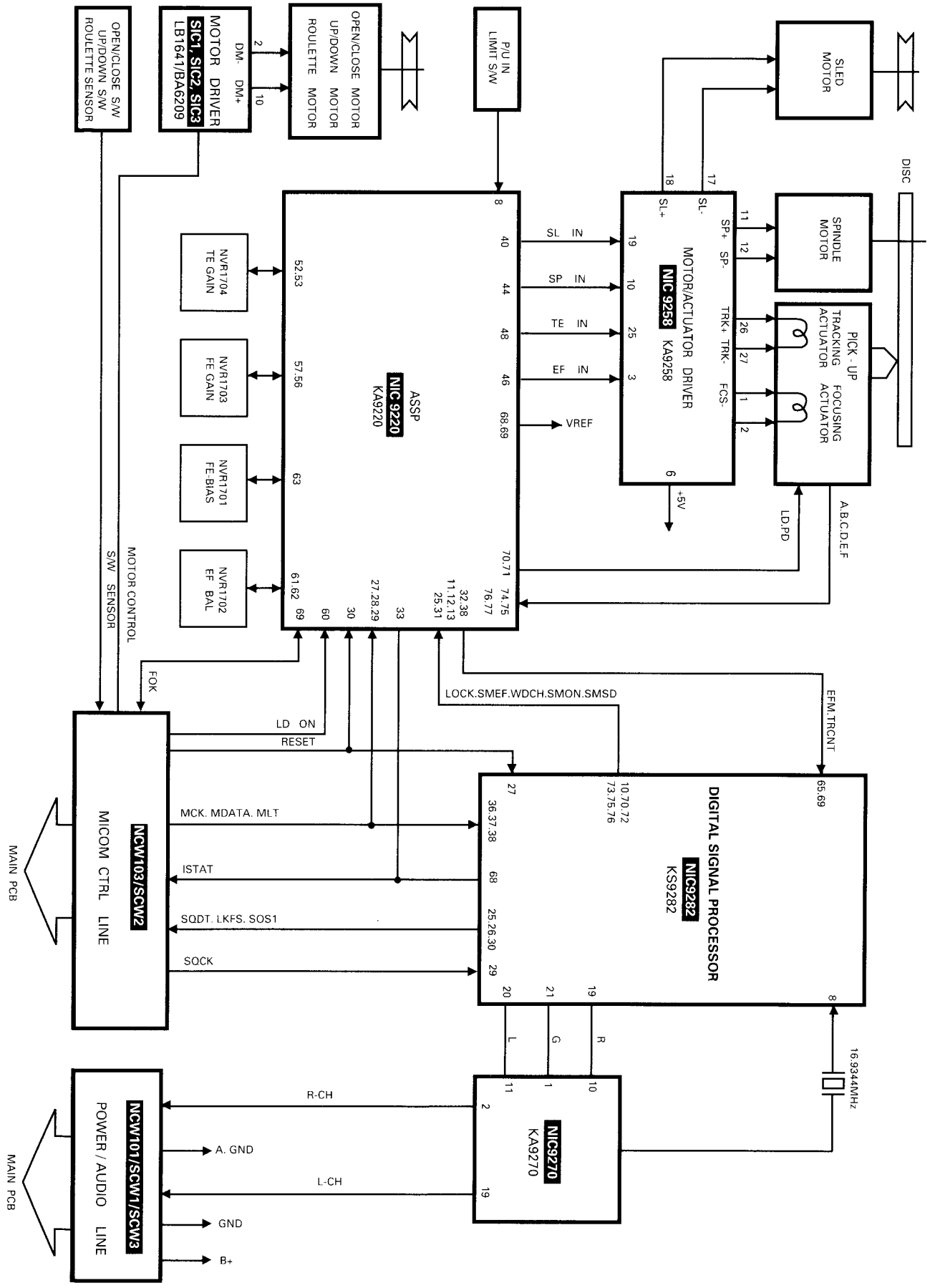
VOLT/DIV:0.1V
TIME/DIV:2mS

7-3-4. To adjust E/F balance (PLAY mode)

1) Set TIME/DIV of the oscilloscope at 2mS.
2) Set Volt/DIV of the oscilloscope at 0.5V.
3) At GND setting of the oscilloscope set the waveform at 0v and then set it in the DC range.
4) Connect;GND disconnector of the oscilloscope to VR and (+)disconnector to center of NVR1704.
5) Load and play the disc.
6) Turn NVR1704 counterclockwise to the minimum value.
7) Raise NVR1702 and adjust the wave form so that the middle of wave comes to the GND of the oscilloscope or until the upper half of waveform becomes symmetrical to the buttom half. (A=B)
8) Adjust NVR1704 in the arrow direction to achieve a normal sound effect.



8-2. CD section



9. Exploded view & parts list

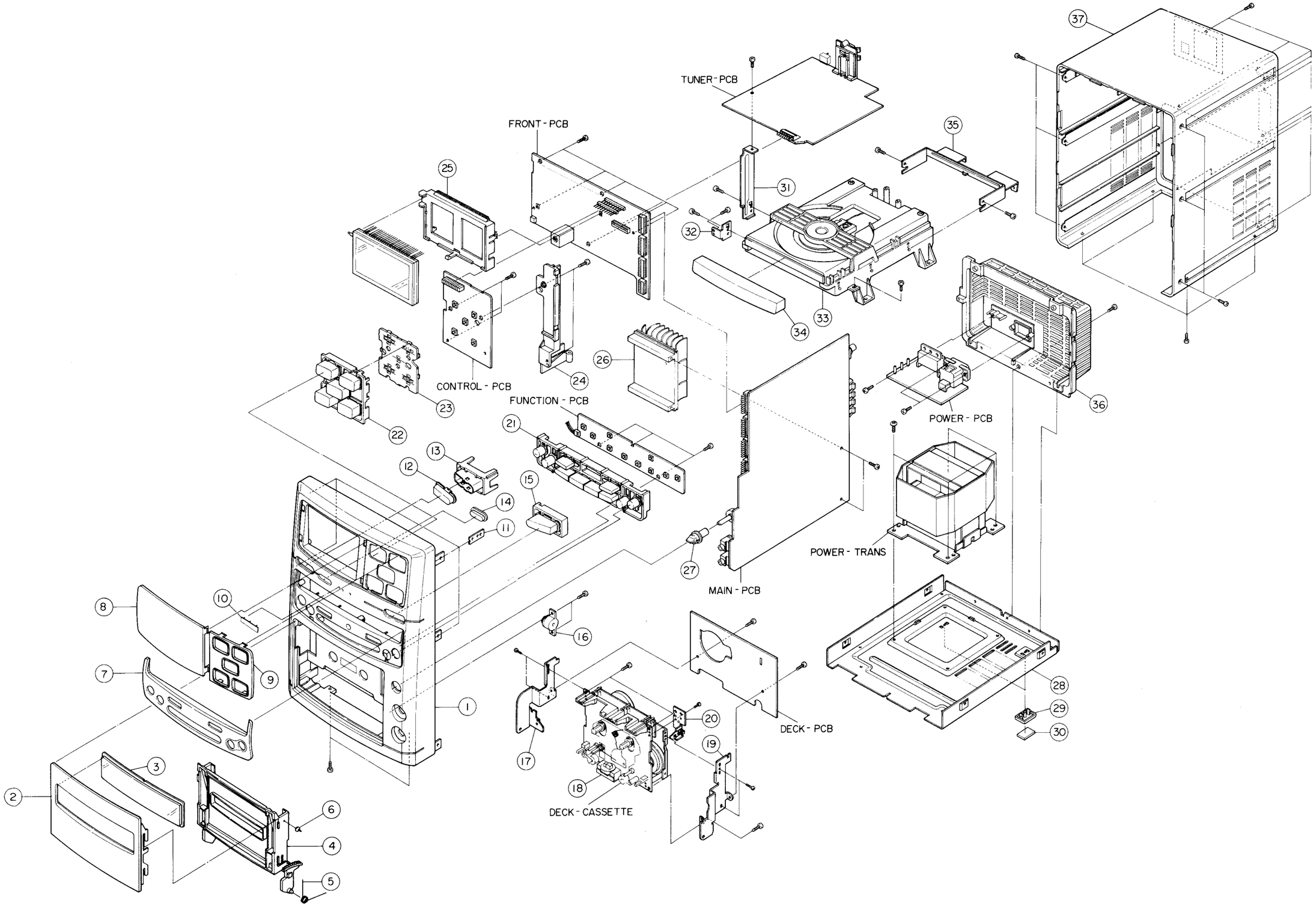
9-1. Main section

9-1-1. Parts list

(★ Exclutive parts)

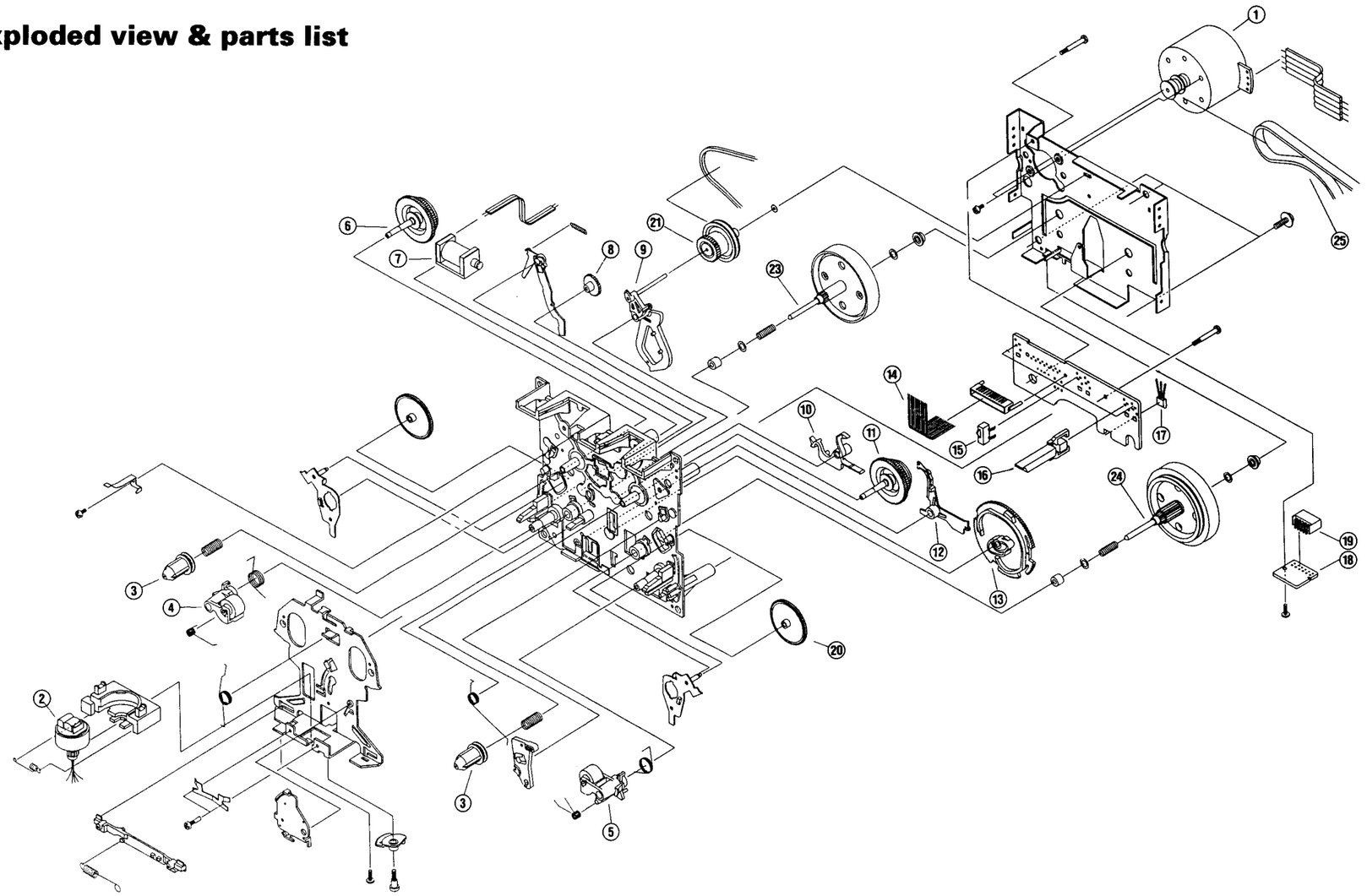
No.	Code no.	Description & Specification	Q'ty	Remark
1	12001-0251-01	CABINET-FRONT ; MM-77 BLK MIPS		
2	14102-0041-01	LID-CASSETTE ; MM-77 BLK ABS		
3	14072-0240-00	WINDOW-DOOR; MM-77 TRP ACRYL		
4	13322-0180-00	HOLDER-CASSETTE; MM-77 BLK ABS		
5	12724-0188-00	SPRING-DOOR; MM-77 SUS PI1.2		
6	11404-0032-02	SHAFT-DOOR ; MSWR 1 2.4		★
7	13322-0183-01	HOLDER-FUNCTION; MM-77 BLK ABS		
8	14072-0239-00	WINDOW-FLT; MM-77 TRP ACRYL		
9	13322-0182-00	HOLDER-CIRCLE ; MM-77 BLK ABS		
10	14534-0011-02	BADGE-BRAND; NEW SAMSUNG AL L30		★
11	13324-0205-00	HOLDER-MOUNTING; MM-77 T1.0 EGI		
12	14082-0683-00	KNOB CAP ; MM-77 TRP PC		
13	14082-0684-00	KNOB-BASE ; MM-77 BLK ABS		
14	14074-0238-00	WINDOW-REMOCON ; MM-77 TRP ACRYL		
15	14082-0647-00	KNOB-OPEN ; MM-77 BLK ABS		
16	15214-506-011	DAMPER-ASSY ; POM PD790		
17	13013-0260-00	BRAKET-DECK(L) ; MM-77 T1.0 SBHG		
18	17159-0038-00	DECK CASSETTE ; CRF452		
19	13013-0261-00	BRAKET-DECK(R) ; MM-77 T1.0 SBHG		
20	19113-0017-01	ASSY LACTCH(R) ; MAX-370 BRKT-MOLD LATCH		★
21	14082-0648-00	KNOB-FUNCTION ; MM-77 BLK ABS		
22	14081-0645-01	KNOB-CIRCLE ; MM-77 BLK/TRP ABS		
23	13323-0185-00	HOLDER-KNOB ; MM-77 BLK ABS		
24	13072-0006-00	SUPPORTER-PCB ; MM-77 BLK ABS		
25	13323-0181-00	HOLDER-FLT ; MM-77 BLK ABS		
26	11123-0051-00	HEAT-SINK ; MM-77 AL 84X65X37		
27	14084-0682-00	KNOB-MIC VOL ; ABS BLACK MM-77		
28	12001-0255-00	CABINET-BOTTOM ; MM-77 T1.2 SBHG		
29	13004-0017-00	FOOT; MM-77 BLK ABS		
30	13054-0044-00	CUSHION-FOOT ; MQ570A T2.0 HH-38C		
31	13013-0269-00	BRACKET-PCB(T) ; MM-77 T1.0 EGI		
32	13013-0257-00	BRACKET-CD(L) ; MM-77 T1.0 SBHG		
33	G3A8-1	ASSY CD PACK ; G3A8 1-CD		
34	13312-0134-00	COVER-TRAY ; MM-77 BLK ABS		
35	13012-0259-00	BRACKET-TUNER ; MM-77 T1.0 SBHG		
36	13322-0179-00	HOLDER-BACK ; MM-77 BLK P.P		
37	12000-0252-01	CABINET-BACK ; MM-77 BLK MIPS		

9-1-2. Exploded view



9-2. Cassette deck exploded view & parts list

9-2-1. Exploded view



9-2-2. Parts list

No.	Code no.	Description & Specification	Q'ty	Remark
	17159-0038-00	DECK CASSETTE ; CRF 452	1	
1	10000-503-004	MOTOR ; SHW2L	1	
2	10000-524-023	ASSY HOLDER HEAD ; YK56RAB4N3	1	
3	10000-611-009	CAP REEL ; 22-222-4041	2	
4	10000-611-010	ASSY PINCH ARM L ; 22-093-4149	1	
5	10000-611-012	ASSY PINCH ARM R ; 22-093-4150	1	
6	10000-611-017	ASSY SUB REEL L ; 22-093-3071	1	
7	10000-611-018	SOLENOID ; 07-W021C	1	
8	10000-611-021	GEAR FF ; 22-222-4048	1	
9	10000-611-022	ASSY ARM FR ; 22-093-4061	1	
10	10000-611-028	ARM BRAKE ; 22-239-3028	1	
11	10000-611-029	ASSY SUB REEL R ; 22-093-4151	1	
12	10000-611-030	ARM TRIGER ; 22-268-3008	1	

No,	Code no.	Description & Specification	Q'ty	Remark
13	10000-611-031	GEAR-CAM ; 22-221-2090	1	
14	10000-611-035	WIRE(13P) ; 22-072-4080	1	
15	10000-611-051	SWITCH-MODE ; 04-SW150	1	
16	10000-611-039	SWITCH LEAF ; 04-MT510041MVJ1	4	
17	10000-611-040	HALL IC ; 00-LB9051A	1	
18	10000-611-046	P.C BOARD ; 22-070-4046	1	
19	10000-611-047	HOUSING ; 00-S5BEH	1	
20	10000-611-057	GEAR-PLAY ; 22-222-4282	2	
21	10000-611-063	ASSY PULLEY FR ; CRF452 22-093-3918	1	
22	10000-611-064	BELT FR ; CRF452 02-083-4127	1	
23	10000-611-065	ASSY FLYWHEEL L ; CRF452 22-220-3738	1	
24	10000-611-066	ASSY FLYWHEEL R ; CRF452 22-093-3917	1	
25	10000-611-067	BELT MAIN ; CRF 452 02-084-4128	1	

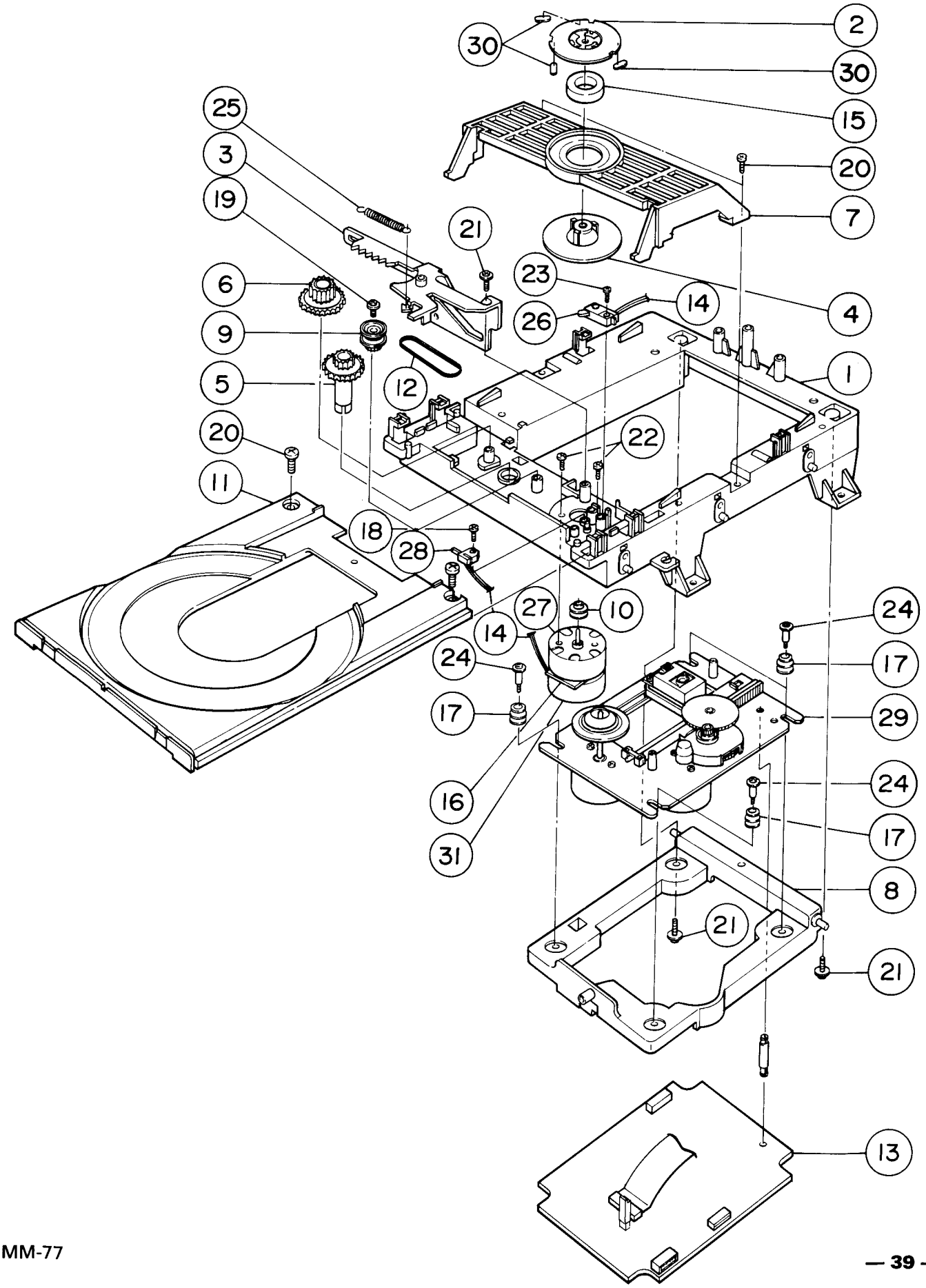
9-3. CD MECHA and Deck exploded view & parts list

9-3-1. CD MECHA Parts list (CMS-P5M6U)

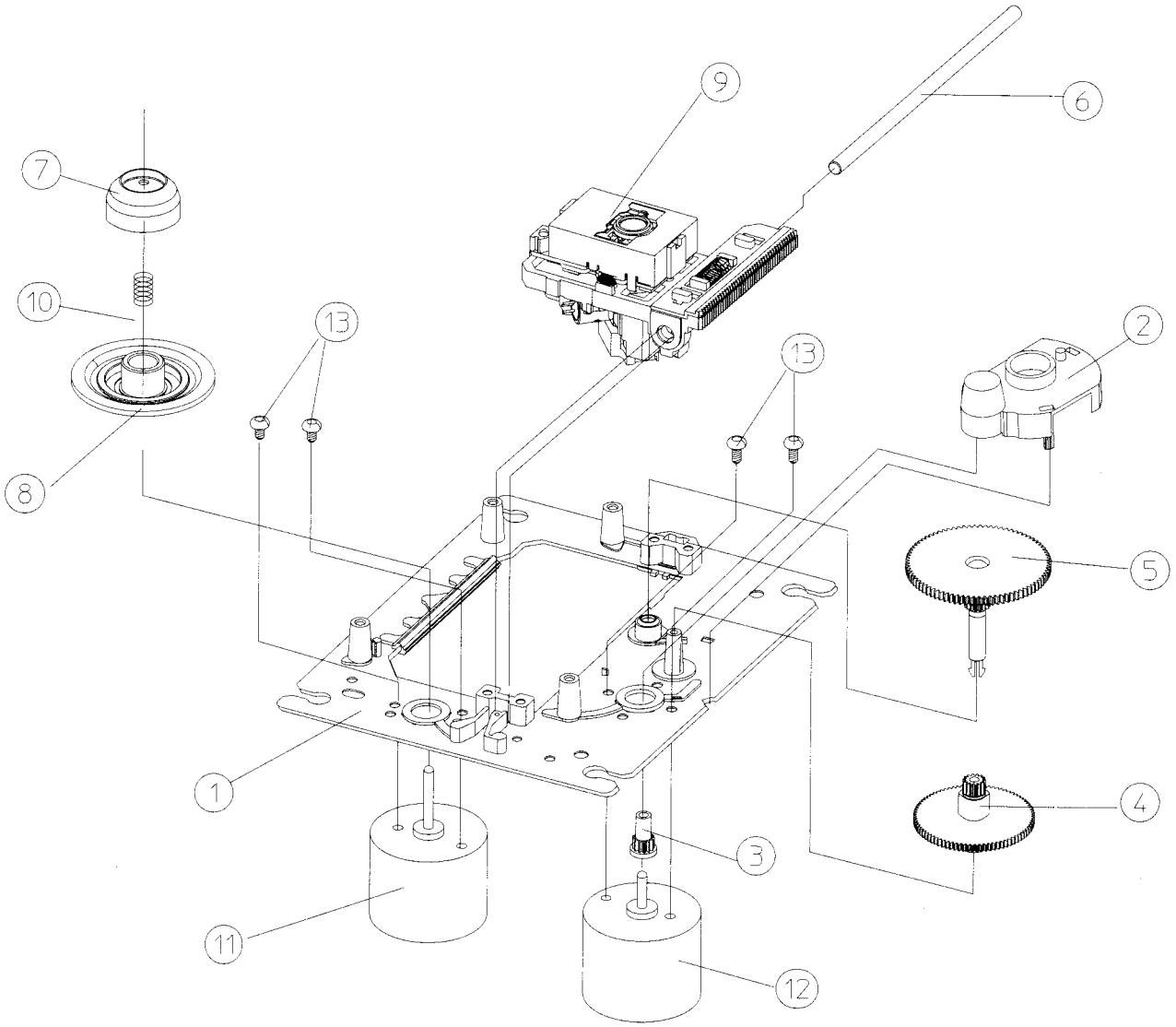
No.	Code no.	Description & Specification	Q'ty	Remark
1	12201-0013-00	BASE-MAIN; ABS BLK	1	
2	13014-0119-00	BRACKET-CHUCK ; CMS-CR1 T0.8 WHT SECC	1	
3	11583-0001-00	CAM; PC BLK CMS-M1	1	
4	12223-0015-00	TABLE-CHUCK; CMS-CR3 T6.7 POM(90-02)	1	
5	11474-0006-00	GEAR(A) ; NYLON12 M0.5/M0.5 Z17/Z45 SP NTR CMS-M1	1	
6	11474-0007-00	GEAR(B) ; POM M0.5/M0.8 Z19/Z46 SP BLK CMS-M1	1	
7	13329-0013-00	HOLDER-CHUCK; ABS BLK CMS-M1	1	
8	11532-0004-00	LEVER-LIFTER DECK ; ABS BLK CMS-M1	1	
9	11504-0001-00	PULLEY-GEAR ; POM D12/M0.51 Z17 SP BLK CMS-M1	1	
10	11504-0002-00	PULLEY-MOTOR ; POM D4 BLK CMS-M1	1	
11	13602-0001-00	TRAY-M1 ; ABS BLK CMS-M1	1	
12	11494-0001-00	BELT-PULLEY ; NEOPLEN FR W1.5 T1.5/78.8 CMS-CR1	1	
13	19129-0357-01	ASS'Y CD PCB ; G3A8 1-CD	1	
14	13070-046-125	CONNECTOR-WIRE,BN ; 51004-06P/51004-06P 1007#28 350	1	
15	14014-500-600	MAGNET-CHUCK ; FERRITE 6P 250+ -20G	1	
16	16024-0083-00	PCB-MOTOR ; FR-1 T1.6 W109 L113 CMS-M1	1	
17	16174-503-411	RUBBER-CD; SI RUBBER BLU CMS-M5M6C	1	
24	15104-531-710	SHAFT-CD; FE FZY 2.6X10.5	1	
25	12724-0010-00	SPRING-CAM; STSW PI0.2 D3.2 CMS-CR1	1	
26	B3022-0004	SWITCH-LEAF ; MLS-1 DC 1.6V 1A	1	
27	B3070-0002	MOTOR-DC ; RF-500TB 9V	1	
28	13573-901-050	SWITCH-MICRO ; SPPB-11 SCDR-200	1	
29	*CMS-P30AM6	DECK-CD ;CMSA30NM6	1	

● Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustractions with reference No.

9-3-2. CD MECHA Exploded view (CMS-P5M6C)



9-3-3. CD deck exploded view (CMS-P30AM6)

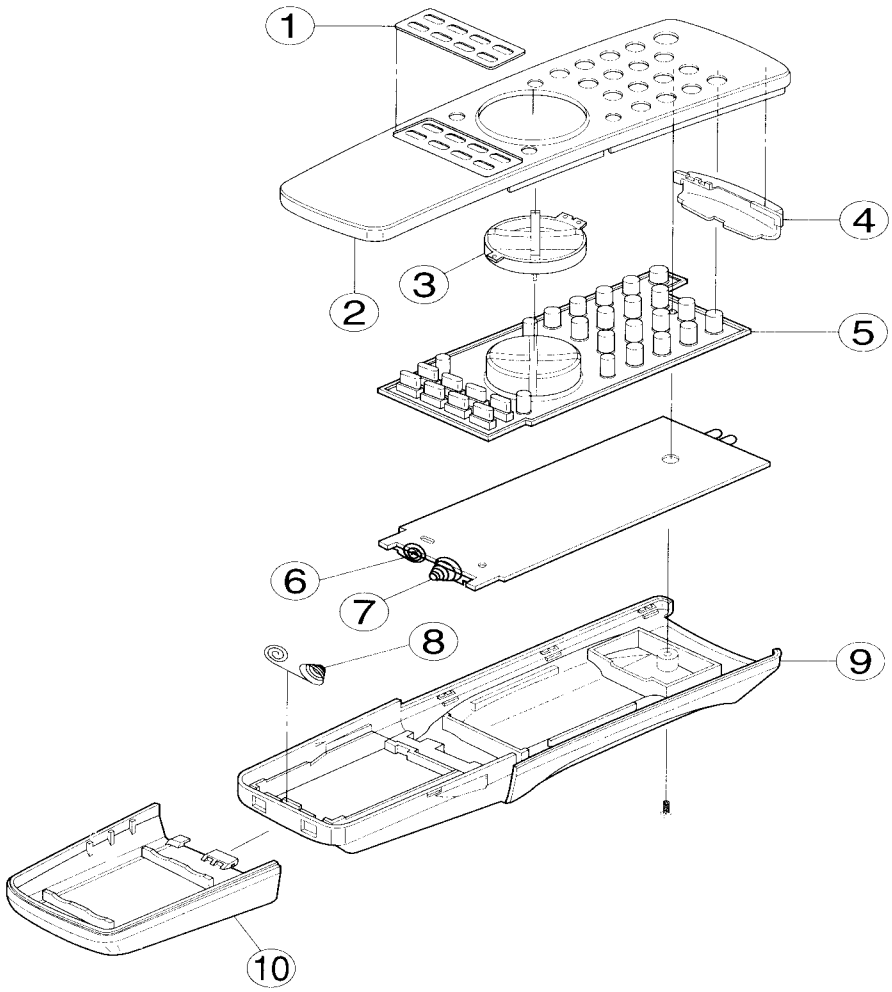


9-3-4. Parts list

No.	Code no.	Description	Specification	Q'ty	Remark
	CMS-P30AM6	DECK -CD	BASIC	1	
1	12201-0052-02	CHASSIS-DECK(M)	CMSA30 POM M90-44	1	
2	13313-0057-00	COVER-GEAR	CMS-V30 BLK ABS	1	
3	11474-0017-00	GEAR(A)	CMS-V30 M0.3 Z13 SP POM	1	
4	11474-0018-00	GEAR(B)	CMS-V30 M0.3 Z13 SP POM	1	
5	11474-0019-00	GEAR(C)	CMS-V30 M0.3 Z16/Z90 SP POM	1	
6	11404-0041-00	SHAFT-PU	CMS-V30 D3 L79 SUS420J2	1	
7	15253-503-011	CENTER-RING	ABS+GS 20% CMS-V10N	1	
8	12223-0003-00	TURN-TABLE(M)	ABS+GS 20% CMS-V10N	1	
9	*SOH-AP	PICK-UP CDP	P/U SOH-A1 ROW V-P/J	1	
10	12724-0062-00	SPRING-T/TABLE	CS STS-W PI0.4 D5.7 L9.3 CMS-V10N	1	
11	16829-0004-00	MOTOR-SPINDLE	RF-310T-11400 43L 25V 85mA	1	
12	14769-057-250	MOTOR-FEED	RF-310TA 30MM NDM4RA3ETL 11.0MM	1	
13	17008-120-032	SCREW-PH(+M2*3)	+M2X3 FE FZY W700	4	

9-4. Remote control

9-4-1. Exploded view

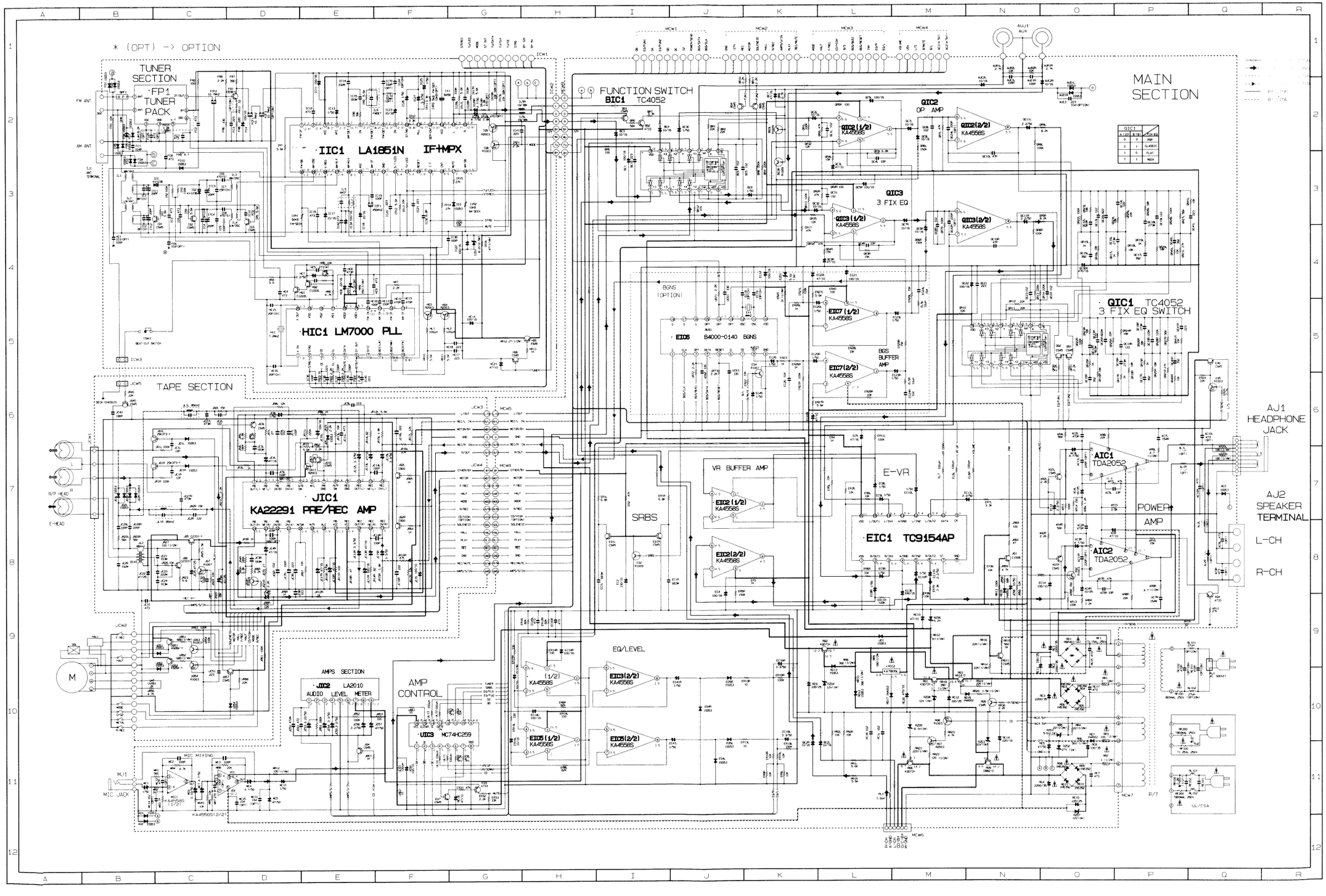


9-4-2. Parts list

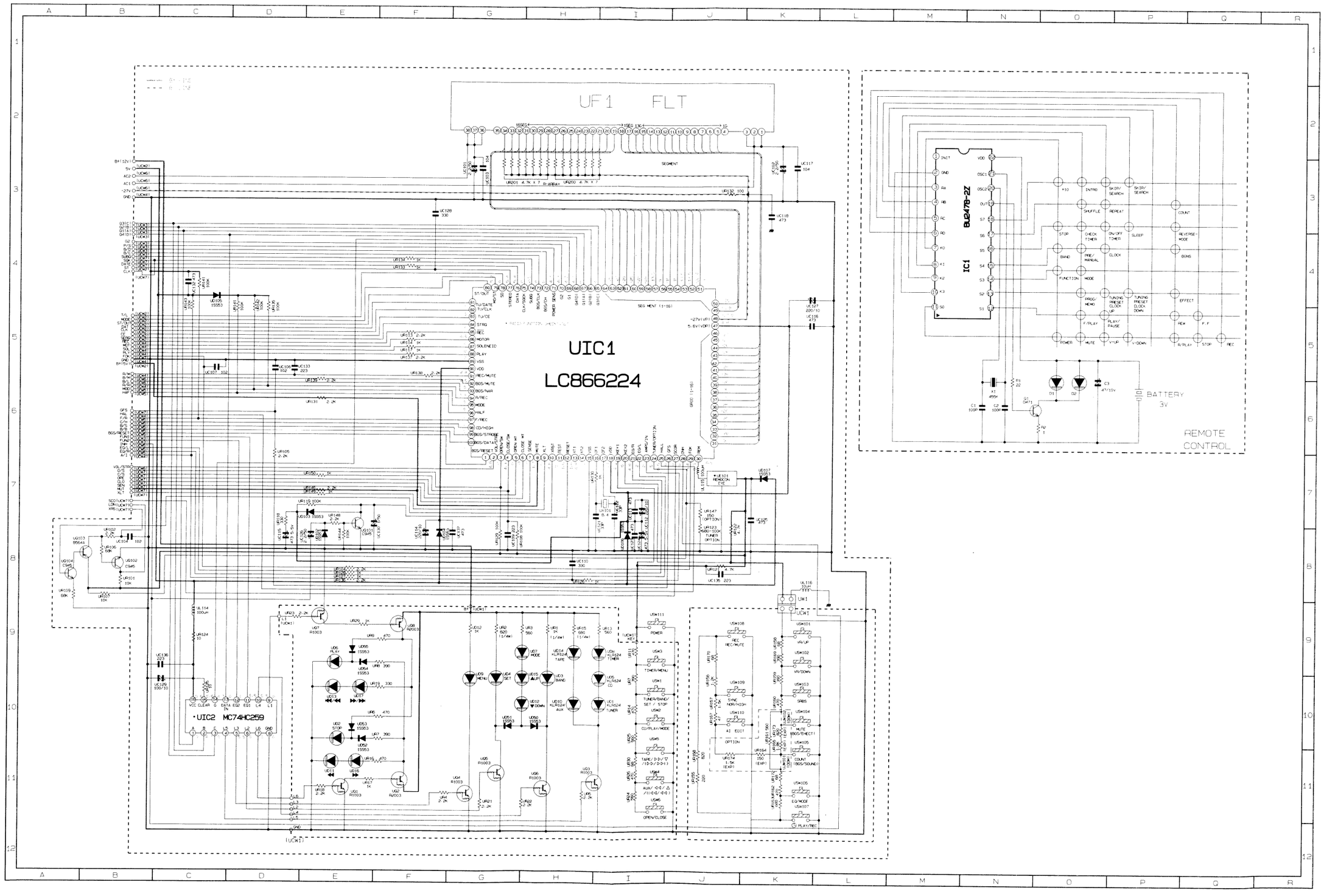
NO.	Code no.	Description & Specification	Q'ty	Remark
	19234-0041-01	ASSY REMOCON ; MM-77	1	
1	14014-0028-01	INLAY-REMOCON; MM-77 BLK PVC SHEET T0.35	1	
2	12001-0248-01	CABINET-TOP ; MM-77 ABS GRAY	1	
3	13353-0043-00	GUIDE-KNOB ; MQ-555 REMOCON ABS 94HB	1	
4	14073-0235-00	WINDOW-REMOCON ; RCD1650/EXP PC	1	
5	14082-0642-01	KNOB-RUBBER ; MM-77 GRAY SILCON	1	
6	12724-0189-00	SPRING-A(+) ; MM-77 STS PI0.6 CD NI-C	1	
7	12724-0190-00	SPRING-B(-) ; MM-77 STS PI0.6 CS NI-C	1	
8	12724-0191-00	SPRING-C ; MM-77 STS304 PI0.6 CS	1	
9	12001-0249-00	CABINET-BOTTOM ; RCD1650/EXP REMOCON	1	
10	14043-0126-00	DOOR-BATTERY ; RCD1650/EXP REMOCON	1	
	11449-518-101	CONDENSER AXIAL-LEAD ; 50V UP050	2	
	12149-401-150	TRANSISTOR ; KSD 471-Y, TAPE	1	
	14539-504-030	CERAMIC-RESONATOR ; CSB455EBL	1	
	B4012-0430	IC-LINEAR ; BU2478 SOP REMOCON	1	

10. Schematic diagram

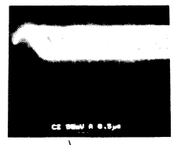
10-1. Main section

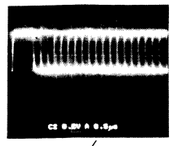


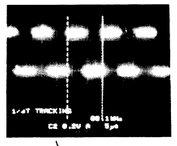
10-2. Front section

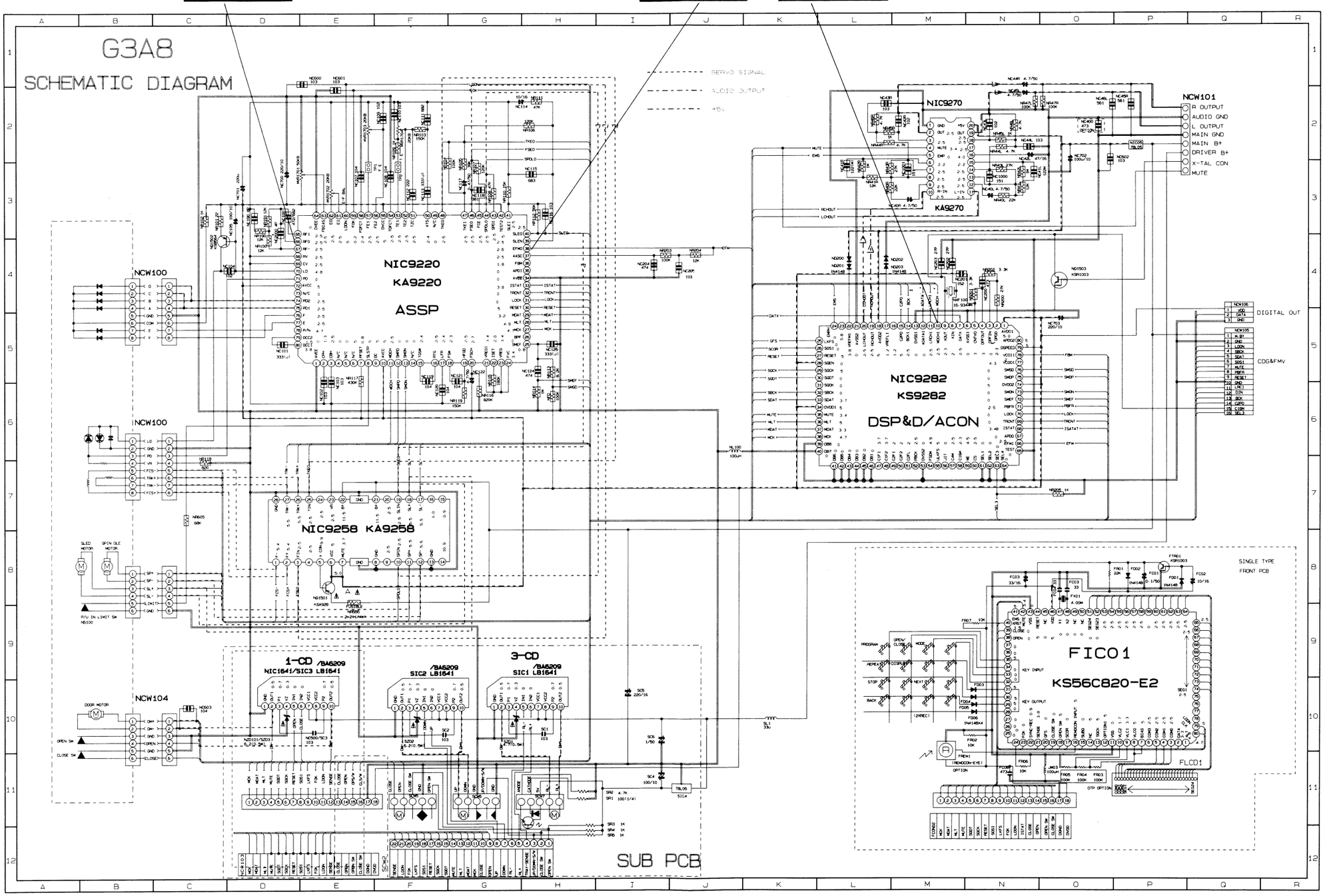


10-3. CD section



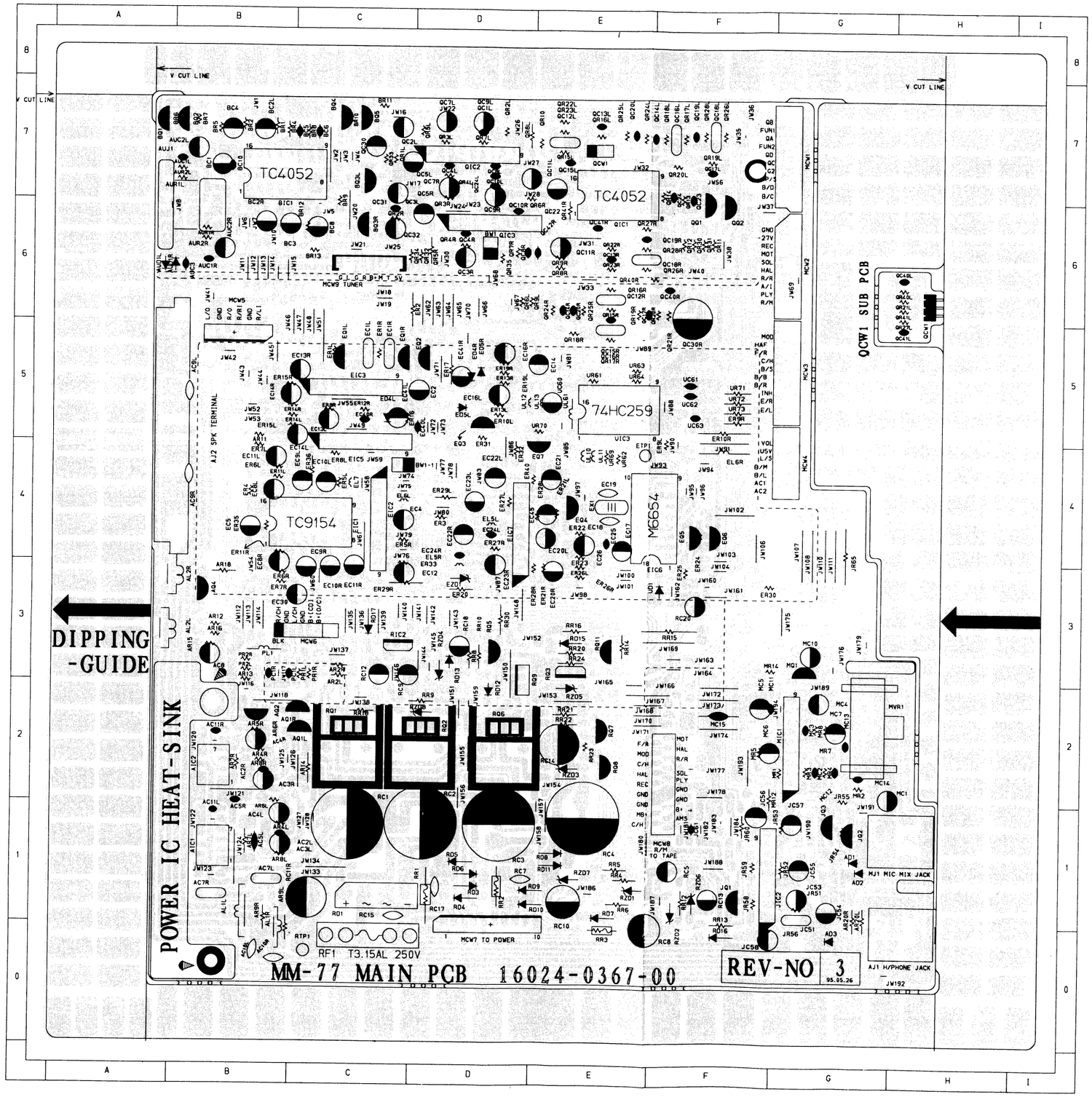






11. PCB Pattern and Marking diagram

11-1. Main section



*** DIODE ***

AD1 (G1)
AD2 (G1)
AD3 (G0)
AUD1L (A6)
AUD1R (B6)
ED4L (C5)
ED4R (D5)
ED5L (D5)
ED5R (D5)
EZD1 (D3)
RD10 (D1)
RD11 (E1)
RD12 (D2)
RD13 (D3)
RD15 (E3)
RD16 (F0)
RD17 (C3)
RD3 (D1)
RD4 (D1)
RD5 (D1)
RD6 (D1)
RD7 (E1)
RD8 (E1)
RD9 (D1)
RZD1 (E1)
RZD2 (F0)
RZD3 (E2)
RZD4 (D2)
RZD5 (E2)
RZD6 (F1)
RZD7 (E1)
RZD8 (C2)
UD1 (F3)

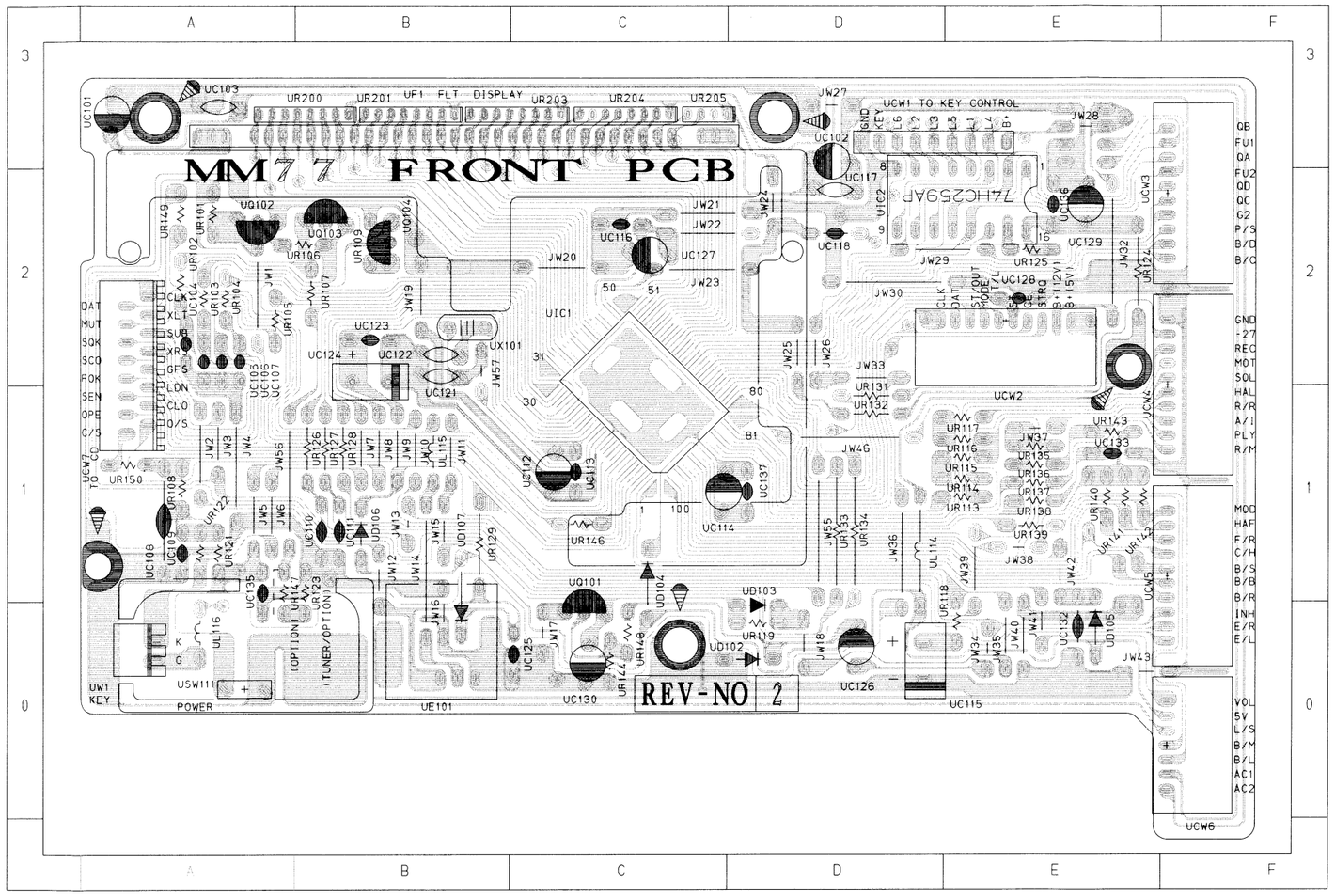
*** TR ***

AQ1L (B2)
AQ1R (B2)
AQ2 (B2)
AQ4 (B3)
BQ1 (A7)
BQ2 (B7)
BQ3L (C7)
BQ3R (C6)
BQ4 (C7)
BQ5 (C7)
EQ1L (C5)
EQ1R (C5)
EQ2 (D5)
EQ3 (D5)
EQ4 (E4)
EQ5 (F4)
EQ6 (F4)
EQ7 (E5)
JQ1 (F1)
JQ2 (G1)
JQ3 (G1)
MQ1 (G3)
QQ1 (F7)
QQ2 (F7)
RIC2 (C3)
RQ11 (E3)
RQ3 (E3)
RQ5 (D3)
RQ7 (E2)
RQ8 (E2)

*** IC&WAFER ***

BW1 (D6)
BW1-1 (C4)
MCW5 (B5)
MCW6 (C3)
MCW7 (D0)
QCW1 (H6)
QCW1 (E7)
RQ9 (D3)

11-2. Front section



*** DIODE ***

UD102 (D0)
UD103 (D0)
UD104 (C1)
UD105 (E1)
UD106 (B1)
UD107 (B0)

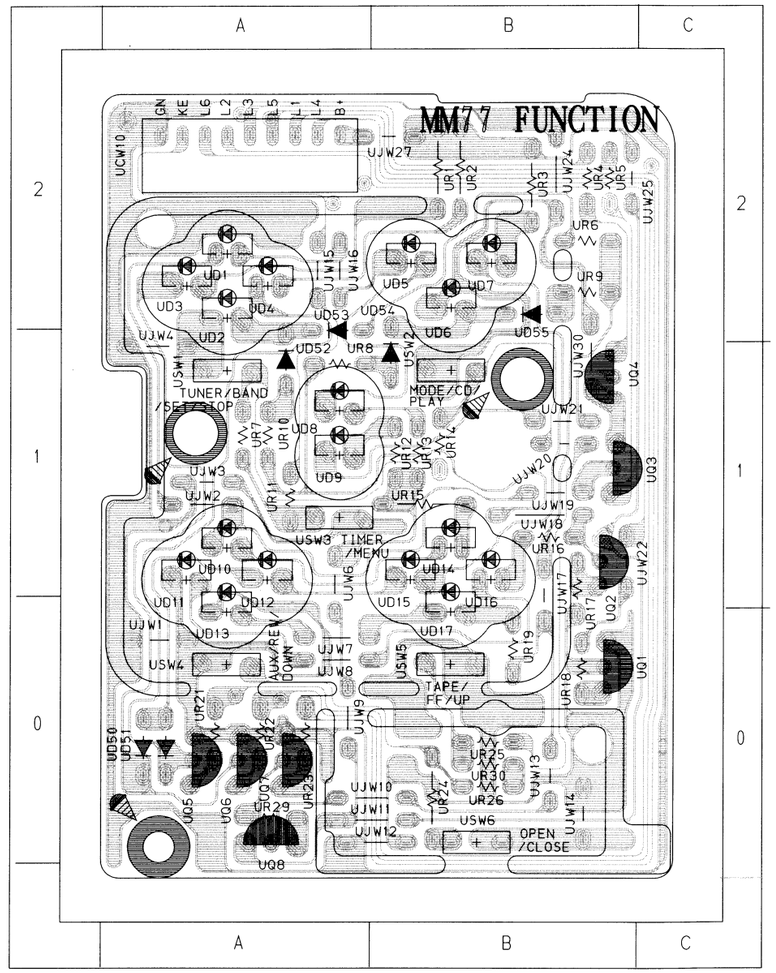
*** TR ***

UQ101 (C0)
UQ102 (A2)
UQ103 (B2)
UQ104 (B2)

*** IC&WAFER ***

USW111 (A0)

11-3. Function section



*** DIODE ***

UD50 (A0)
UD51 (A0)
UD52 (A2)
UD53 (A2)
UD54 (B2)
UD55 (B2)

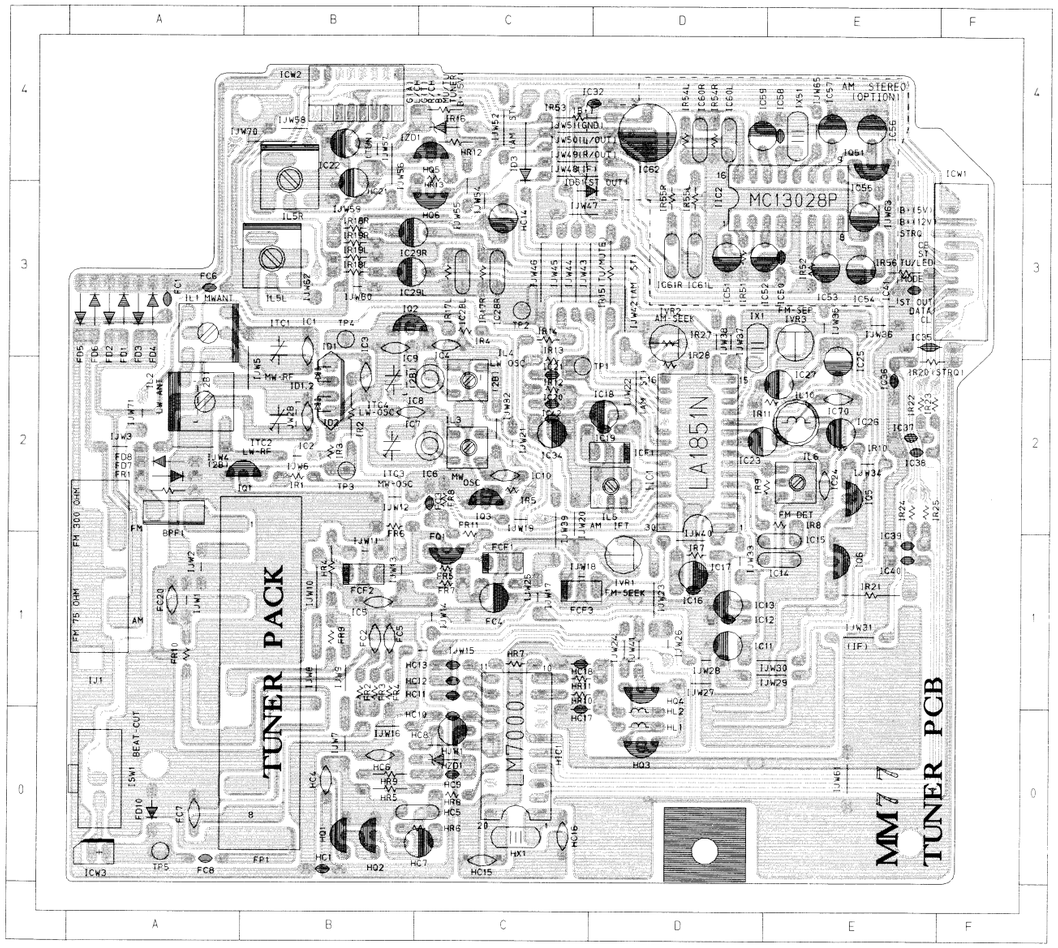
*** TR ***

UQ1 (B0)
UQ2 (B1)
UQ3 (B1)
UQ4 (B1)
UQ5 (A0)
UQ6 (A0)
UQ7 (A0)
UQ8 (A0)

*** IC&WAFER ***

USW1 (A1)
USW2 (B1)
USW3 (A1)
USW4 (A0)
USW5 (B0)
USW6 (B0)

11-4. Tuner section



xxx DIODE xxx

FD1 (A3)
FD10 (A0)
FD2 (A3)
FD3 (A3)
FD4 (A3)
FD5 (A3)
FD6 (A3)
FD7 (A2)
FD8 (A2)
HZD1 (B0)
ID3 (C3)
ID51 (D3)
IZD1 (B4)

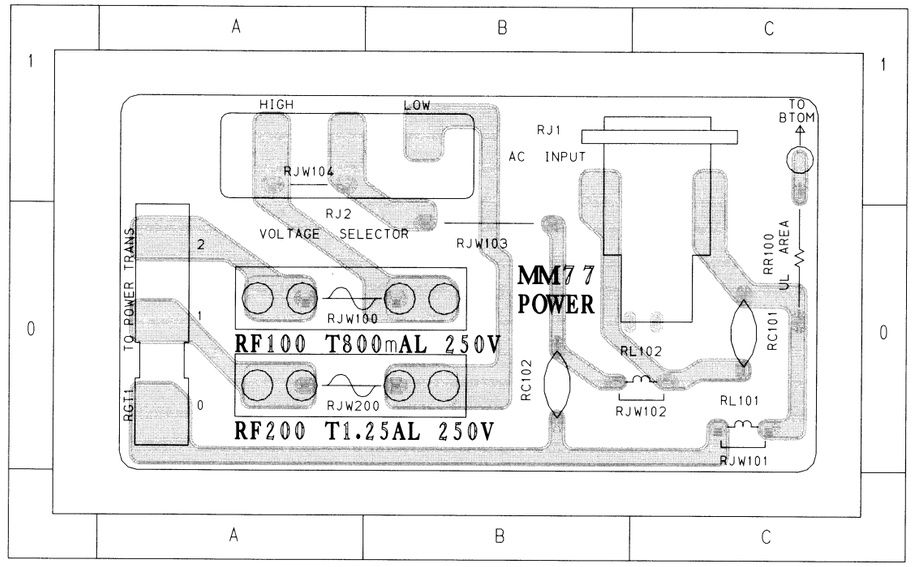
xxx TR xxx

FQ1 (C1)
HQ1 (B0)
HQ2 (B0)
HQ3 (D0)
HQ4 (D1)
HQ5 (B4)
HQ6 (C3)
IQ1 (A2)
IQ2 (B3)
IQ3 (C2)
IQ5 (E2)
IQ51 (E4)
IQ6 (E1)

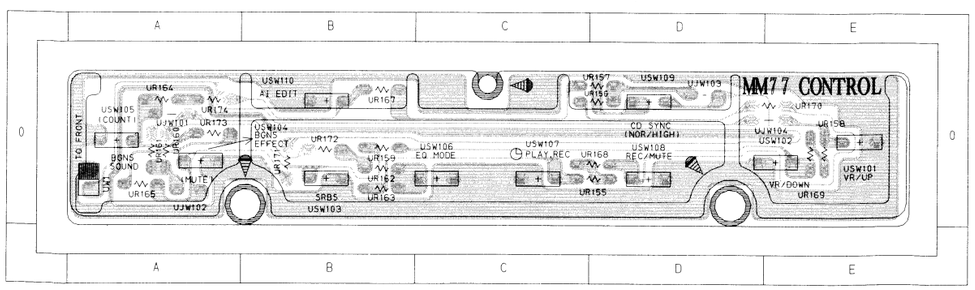
xxx IC&WAFER xxx

ICW3 (A0)

11-5. Power section



11-6. Control section

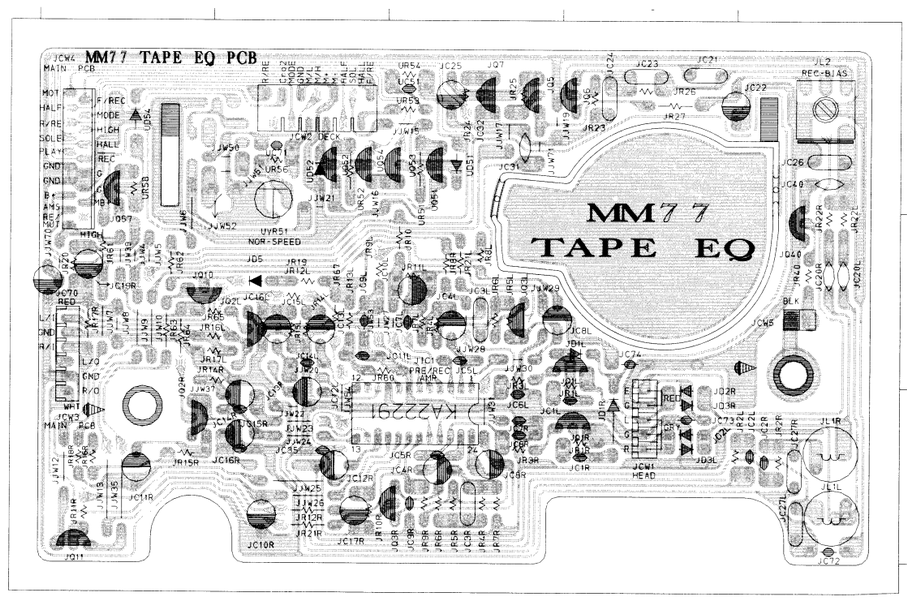


xxx IC&WAFER xxx

USW101 (E0)
USW102 (E0)
USW103 (B0)
USW104 (A0)
USW105 (A0)
USW106 (C0)
USW107 (C0)
USW108 (D0)
USW109 (D0)

USW110 (B0)
UW1 (A0)

11-7. Tape section



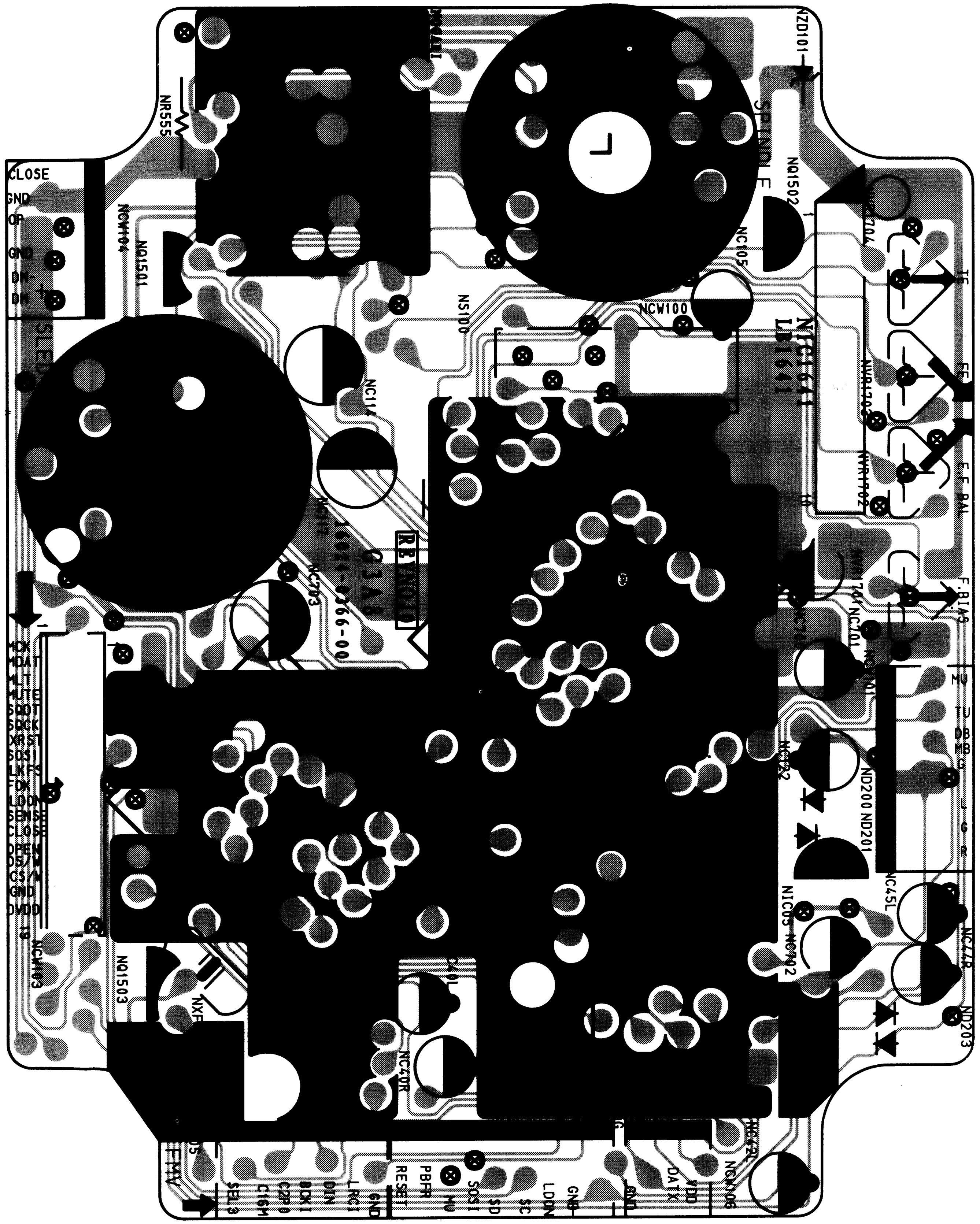
JD1L (D1)
JD1R (D1)
JD2L (D0)
JD2R (D0)
JD3L (D0)
JD3R (D0)
JD5 (B1)
JD51 (C2)
JD52 (B2)
JD54 (A2)

JQ10 (B1)
JQ11 (A0)
JQ1L (C1)
JQ1R (C0)
JQ2L (B1)
JQ2R (A0)
JQ3L (C1)
JQ3R (C0)
JQ40 (E1)
JQ5 (C2)
JQ57 (A2)
JQ6 (D2)
JQ7 (C2)
UQ51 (C2)
UQ52 (B2)
UQ53 (C2)
UQ54 (B2)

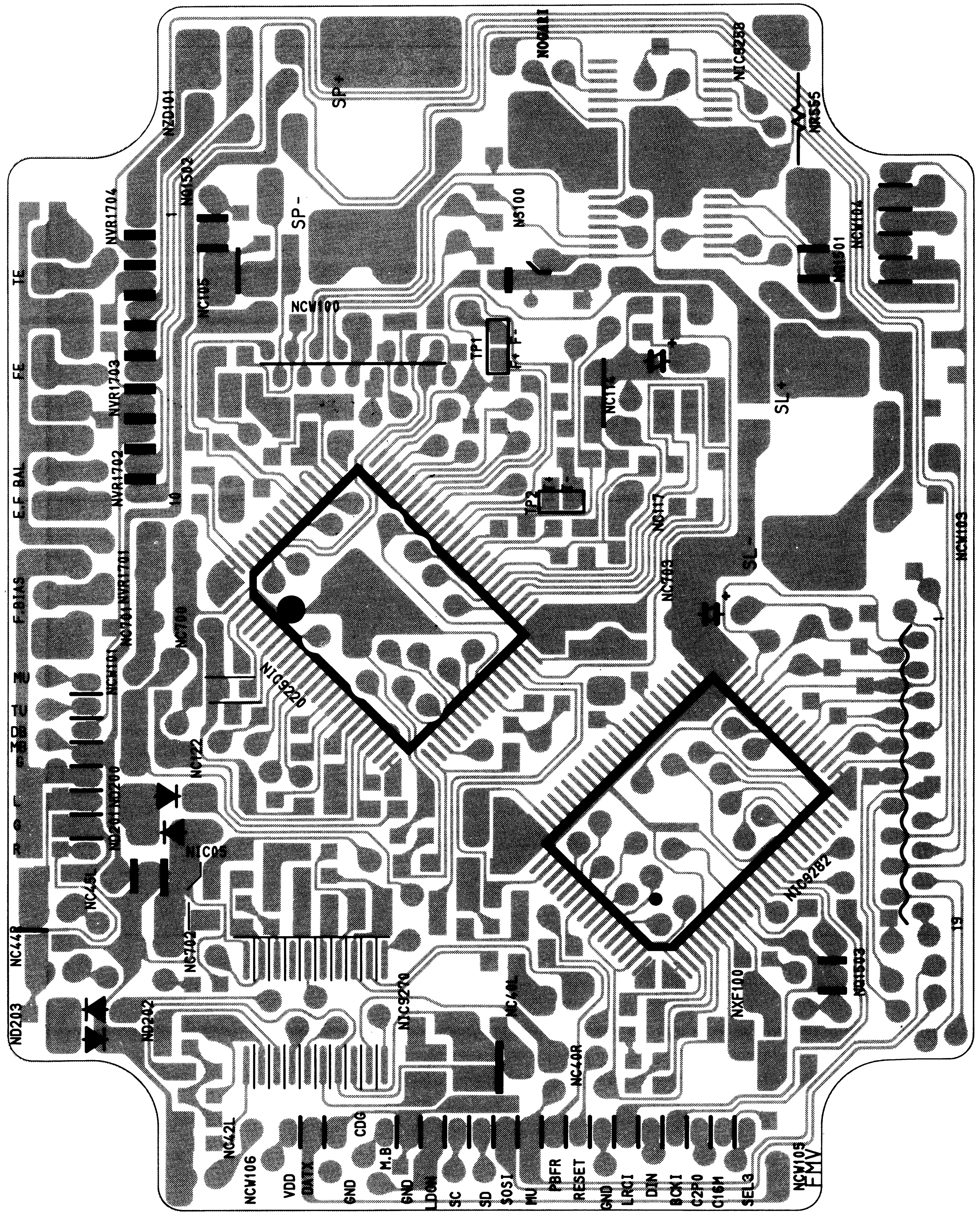
JCW1 (D0)
JCW5 (E1)

11-8. CD section

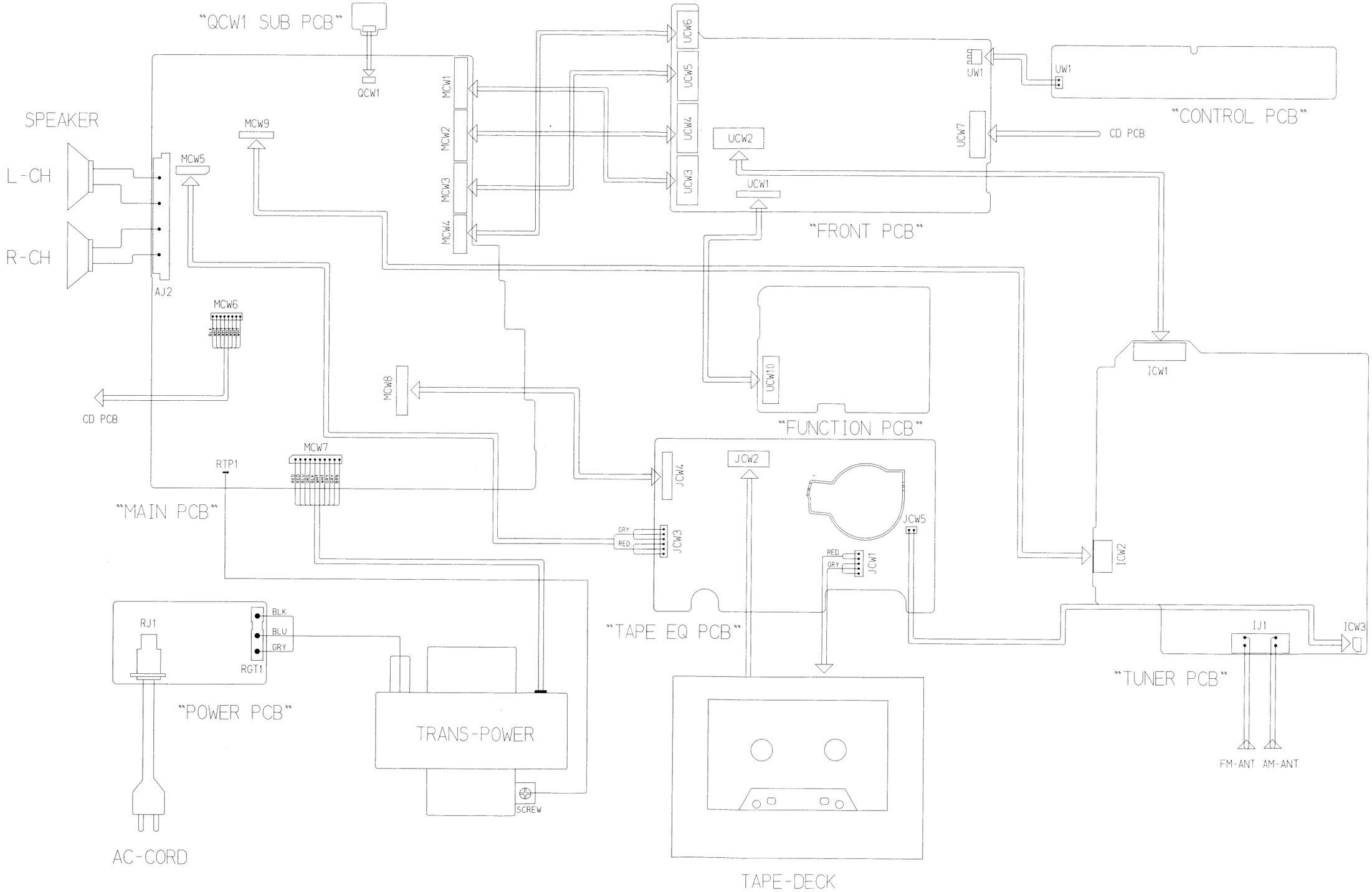
11-8-1. Top part


CLOSE
GND
OP
GND
DM-
DM
SLED
NR555
NCW104
NQ1501
NS100
NC114
NC117
NC703
NCW100
NC105
NQ1502
SPINDLE
NZD101
NTC1641
LB1641
NVR1704
NVR1703
NVR1702
NVR1701
NC700
NC701
NC122
ND200 ND201
NC45L
NIC05 NC702
NC44R
ND203
TE
FE
E.F BAL
F.BIAS
MU
TU
DB
MB
G
L
G
R
MCK
MDAT
MLT
MUTE
SQDT
SQCK
XRST
SOSI
LKFS
FOK
LDON
SENSE
CLOSE
OPEN
DS/M
CS/M
GND
DVDD
NCW103
NQ1503
NXF
NC40R
FMV
SEL3
C16M
C2PO
BCKI
DIN
LRCI
GND
RESET
PBFR
MU
SOSI
SD
SC
LDON
GND
DATX
VDD
NCW106
NC42L

11-8-2. Bottom part


NZD101
NQ1502
NVR1704
NVR1703
NVR1702
NVR1701
NC105
SP-
SP+
NCW100
NS100
TP1
TP2
NC114
NQ1501
NCW104
NR555
NIC9258
SL+
SL-
NC703
NS117
NCW103
NIC9220
NIC9282
NC700
NC122
NIC05
NC45L
NC44R
NC702
ND203
ND202
NIC9270
NC40L
NC40R
NXF100
NQ1503
NC42L
TE
FE
E.F BAL
F.BIAS
MU
TU
DB
MB
G
L
G
R
NCW106
VDD
DATX
GND
M.B
CDG
GND
LDON
SC
SD
SOSI
MU
PBFR
RESET
GND
LRCI
DIN
BCKI
C2PO
C16M
SEL3
NCW105
FMV

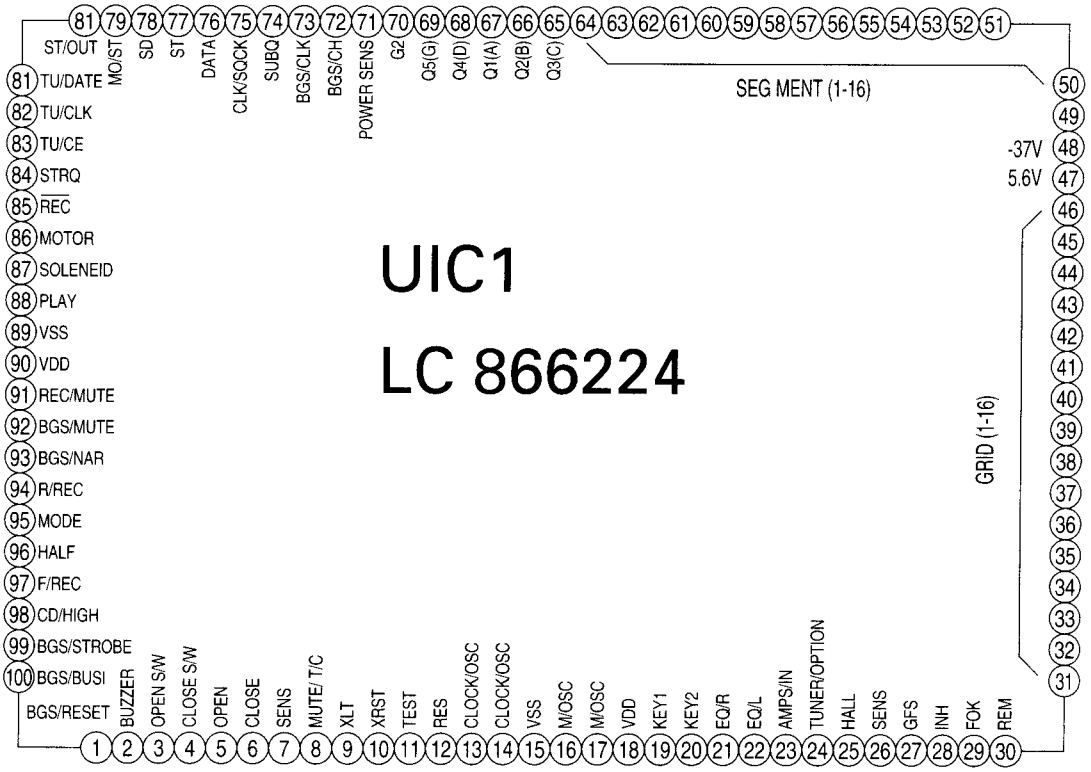
12. Wiring diagram



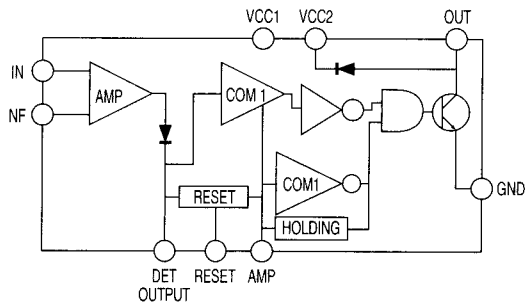
13. IC & TR internal diagram

13-1. Main section

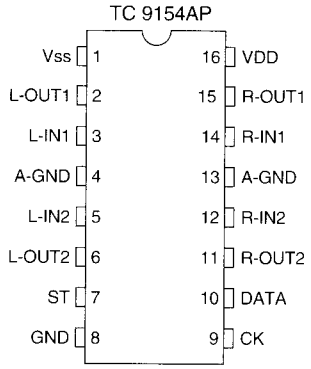
• **LC 866224 (μ-COM): UIC 1**

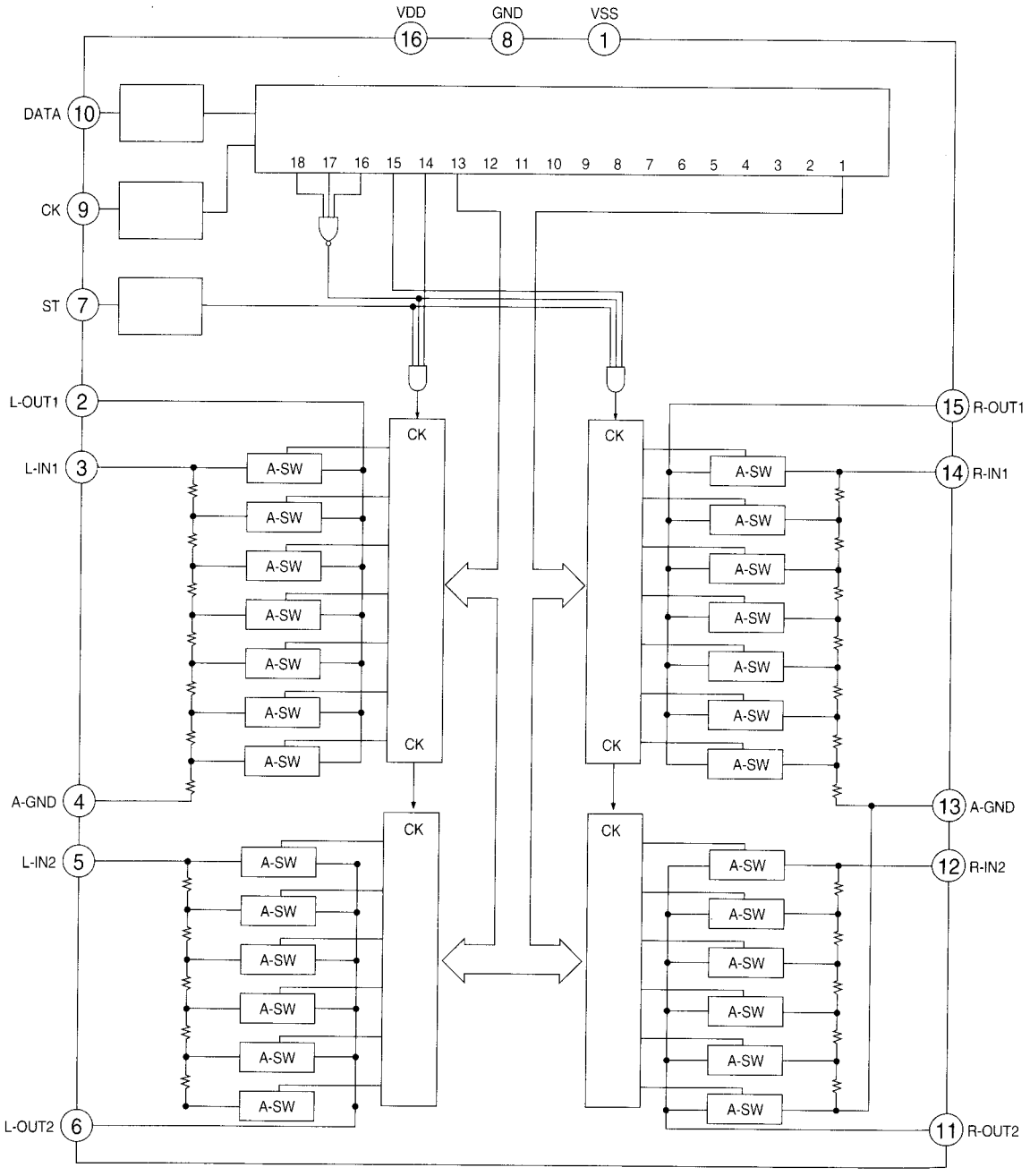


• **LA2010 (AMPS IC): JIC 2**

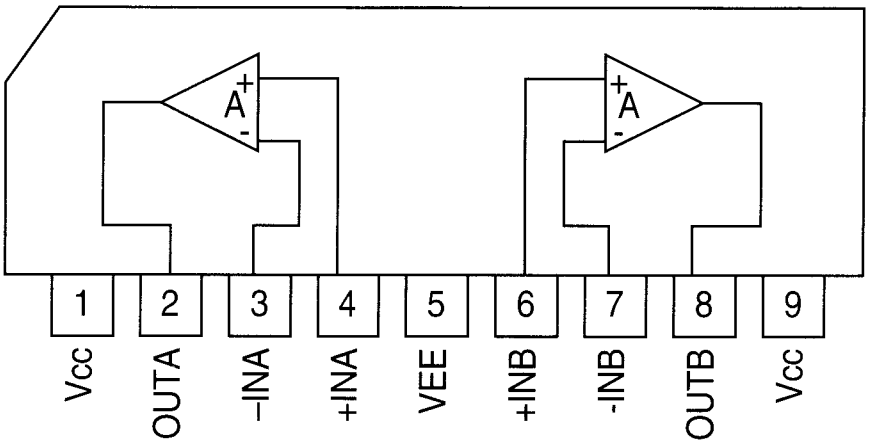


• **TC 9154AP (VR IC): EIC 1**

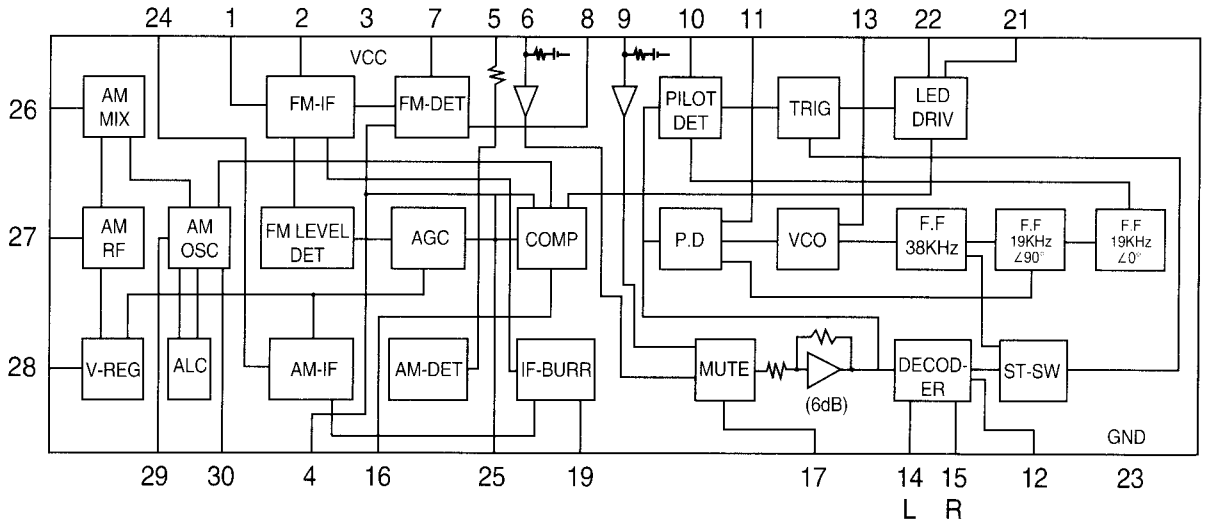




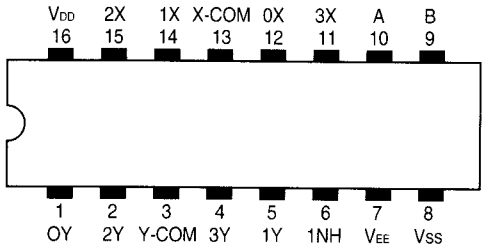
● **KA4558S(OP AMP): QIC2,3, EIC2,3,5, MIC1**

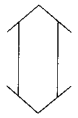


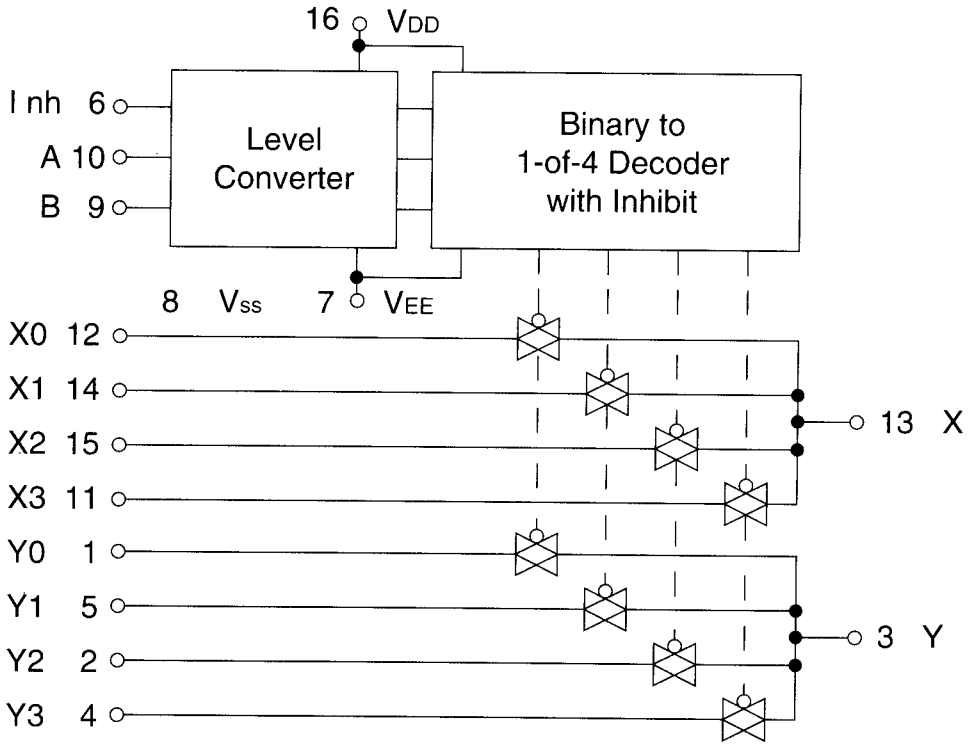
● **LA1851N(FM, AM,IF IC) : IIC1**



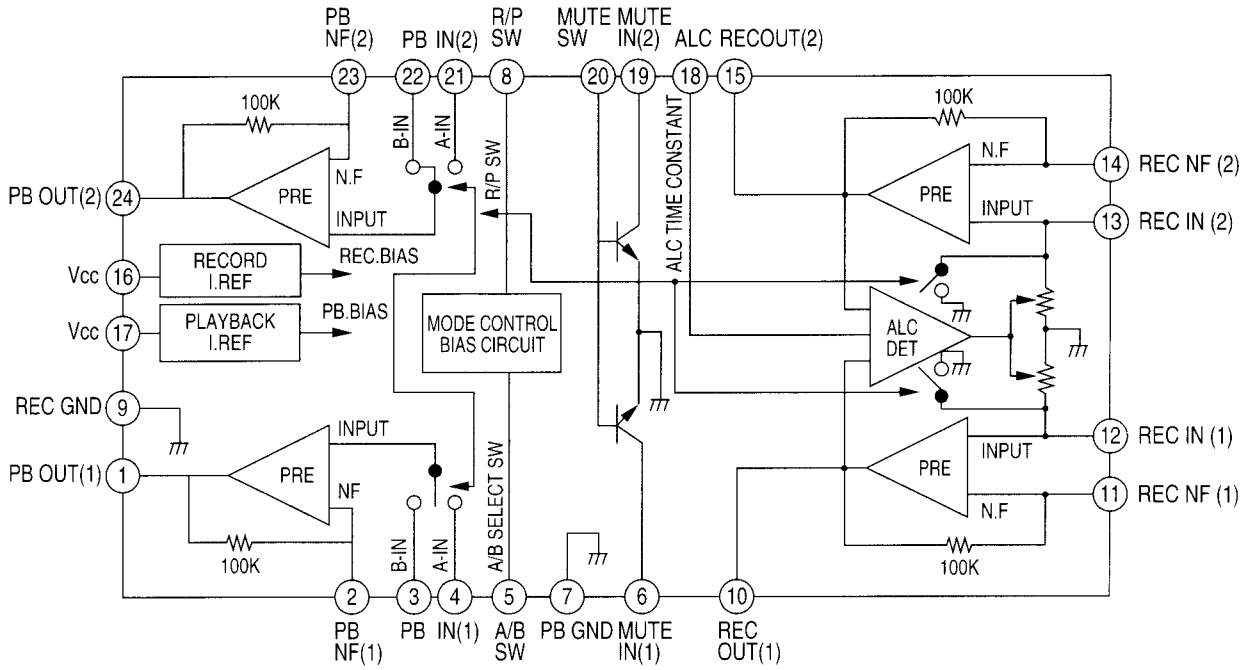
● **MC1405B(FUNCTION IC) : BIC1, QIC1**



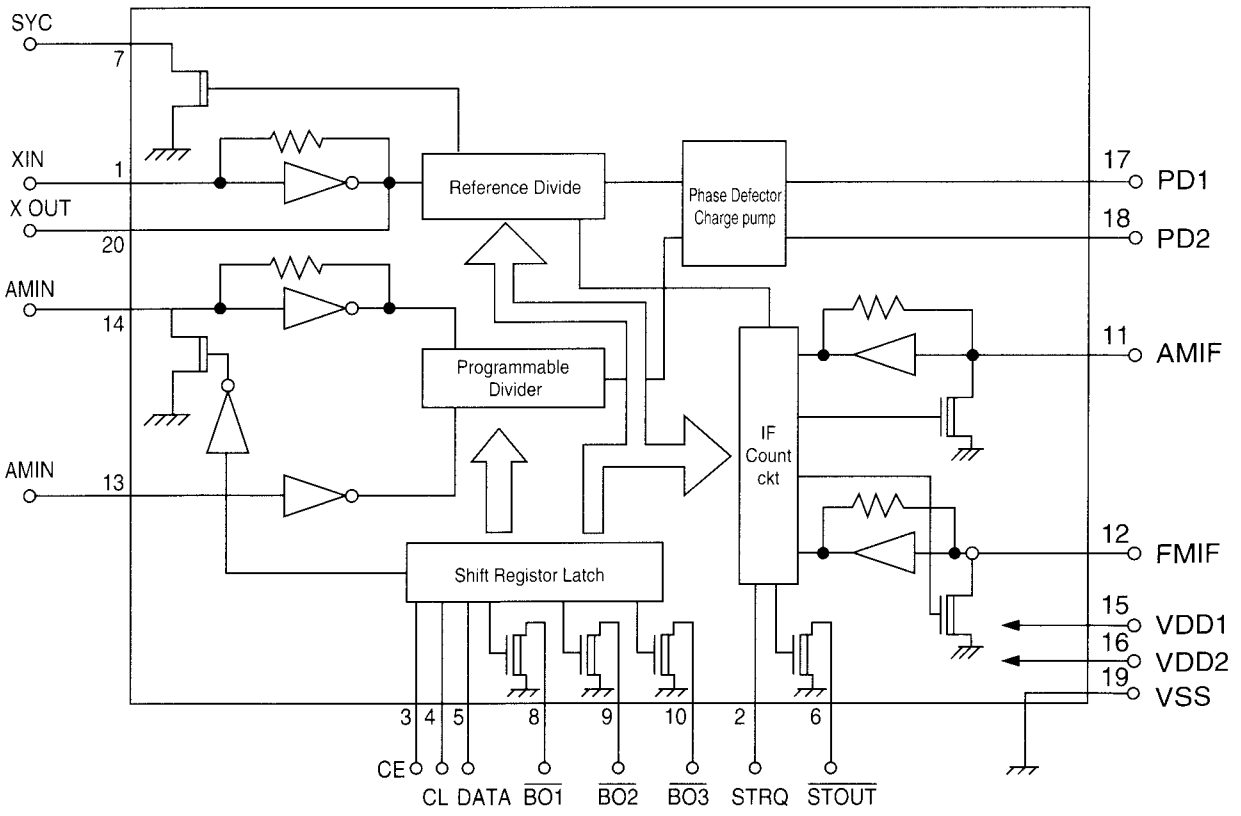




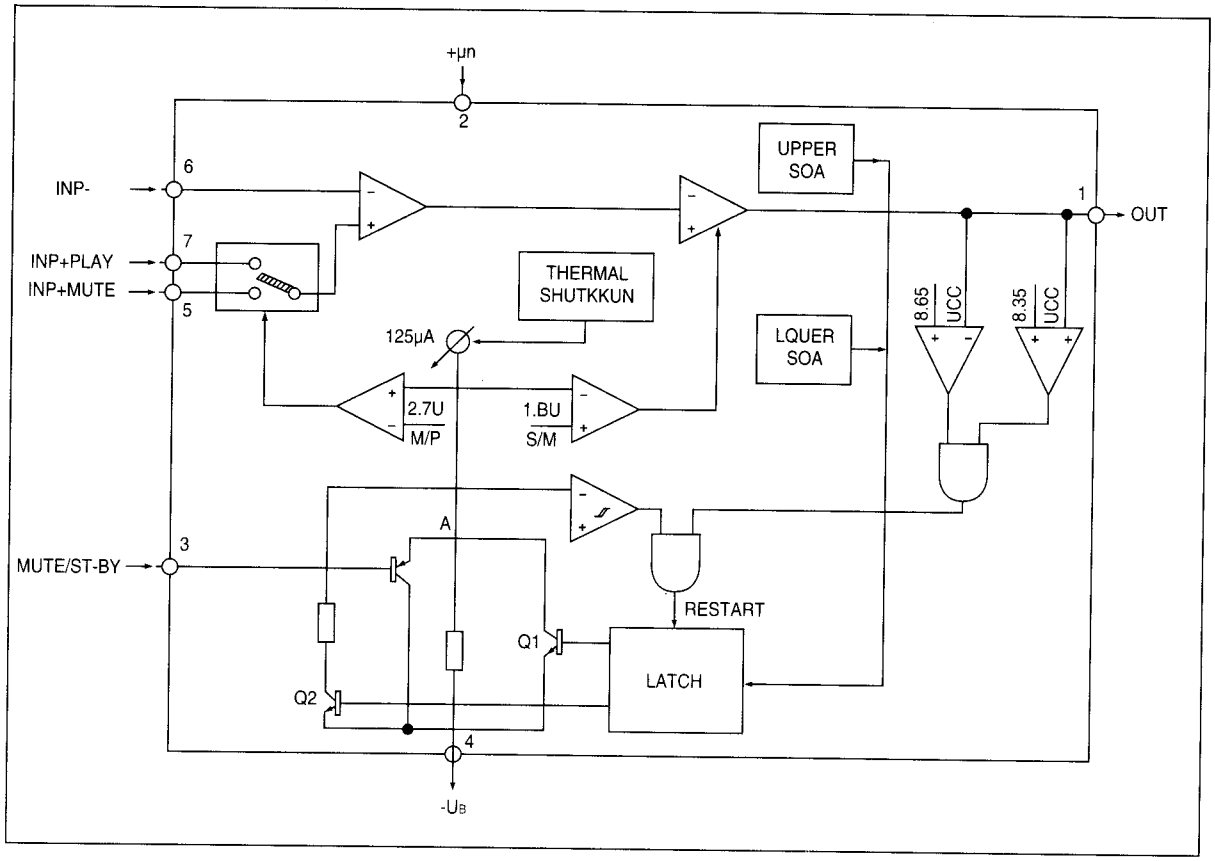
● **KA22291 : JIC1**



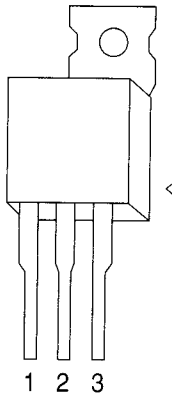
● **LM7000 : HIC1**



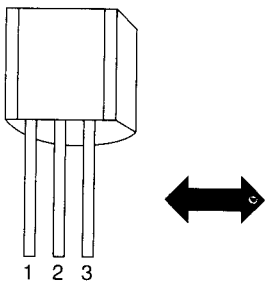
● TDA2052 (POWER IC) : AIC1,2



● TR



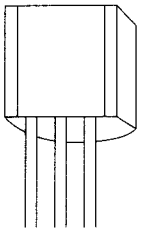
TR/IC	1	2	3
KA7805	IN	GND	OUT
KSD73-Y KSA 614-Y	B	C	E



TR	1	2	3
KSC 2331 KSR 1003, KSR 1009 KSA 928A, KSR 2003	E	C	B
KSC 945. KSA 733 KSB 564, KSC 1222L KSC 838	E	B	C

13-2. CD section

■TR

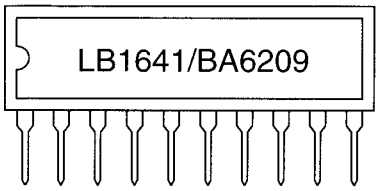


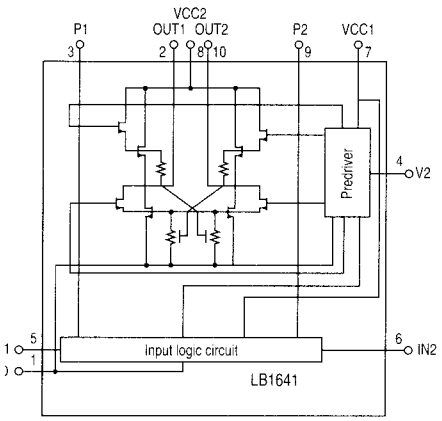
TR	1	2	3
KSR1003 A928	E	C	B

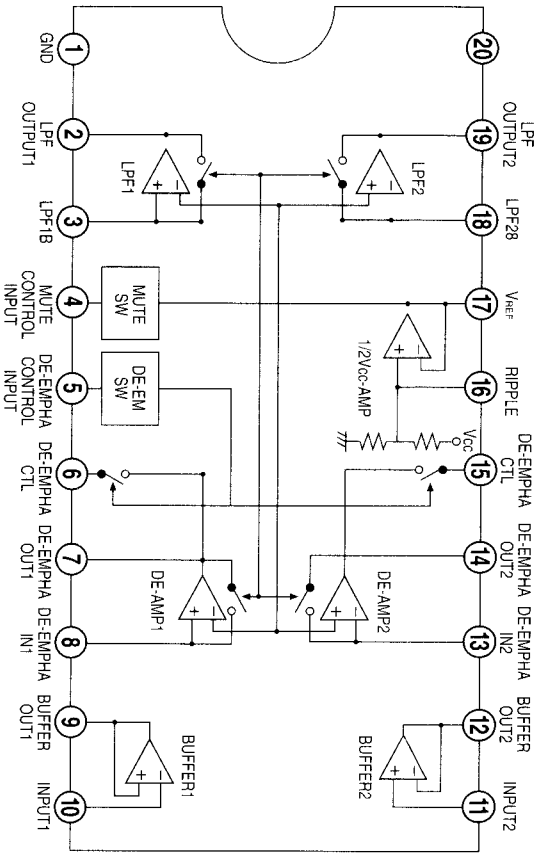
* NOTE : KSB564 = 'EBC' TYPE

● KA9270 : NIC9270

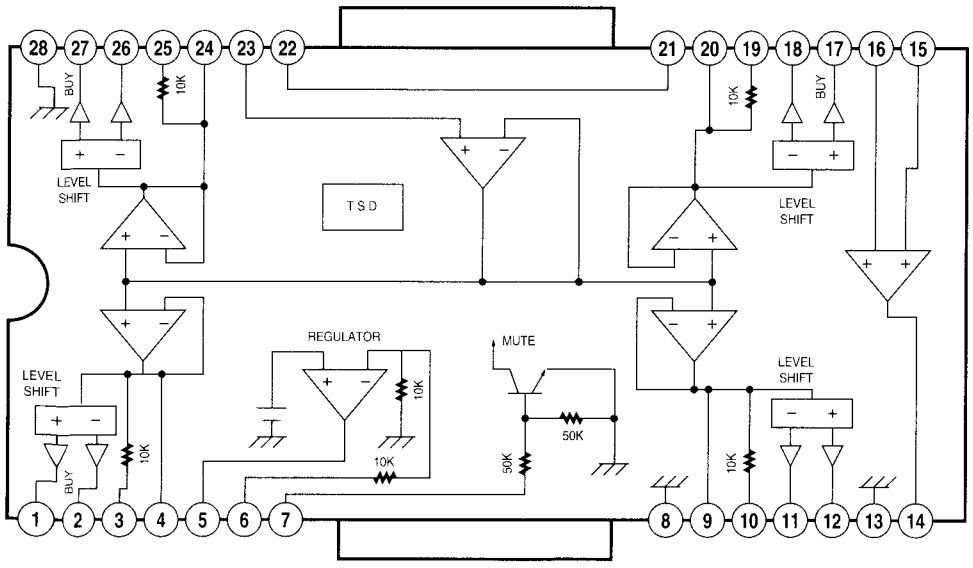
● LB 1641/BA6209 (MOTOR DRIVER) : SIC1, SIC2,SIC5,NIC1641



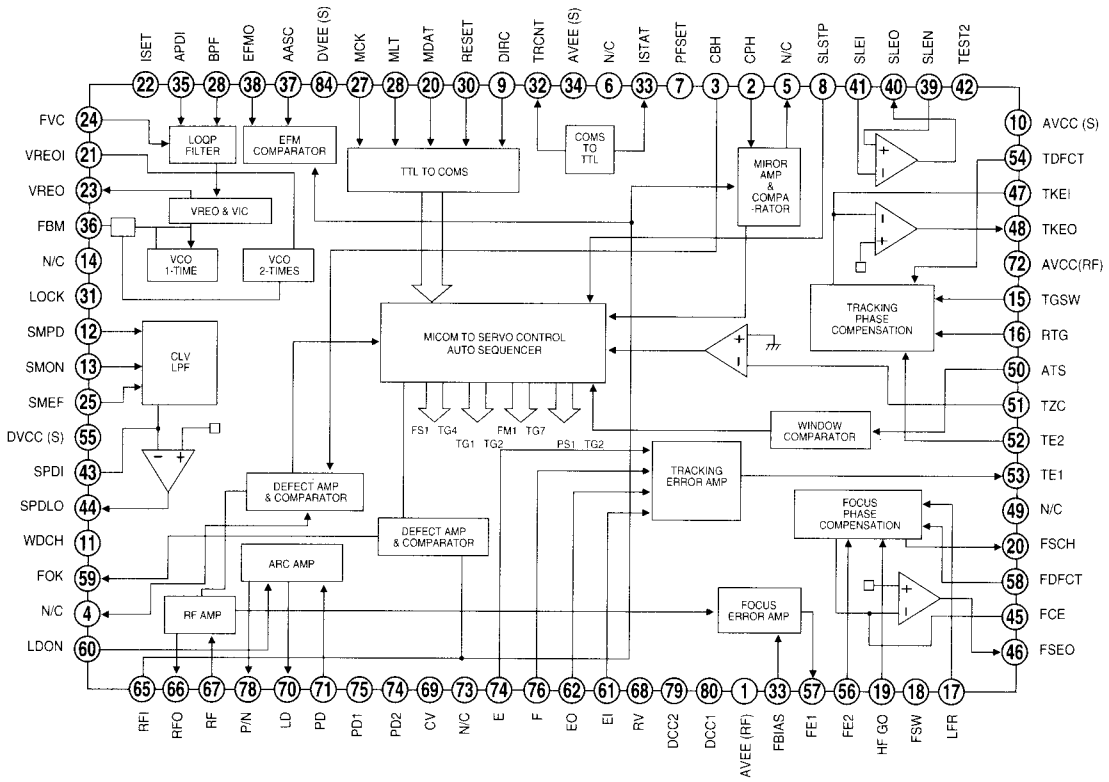




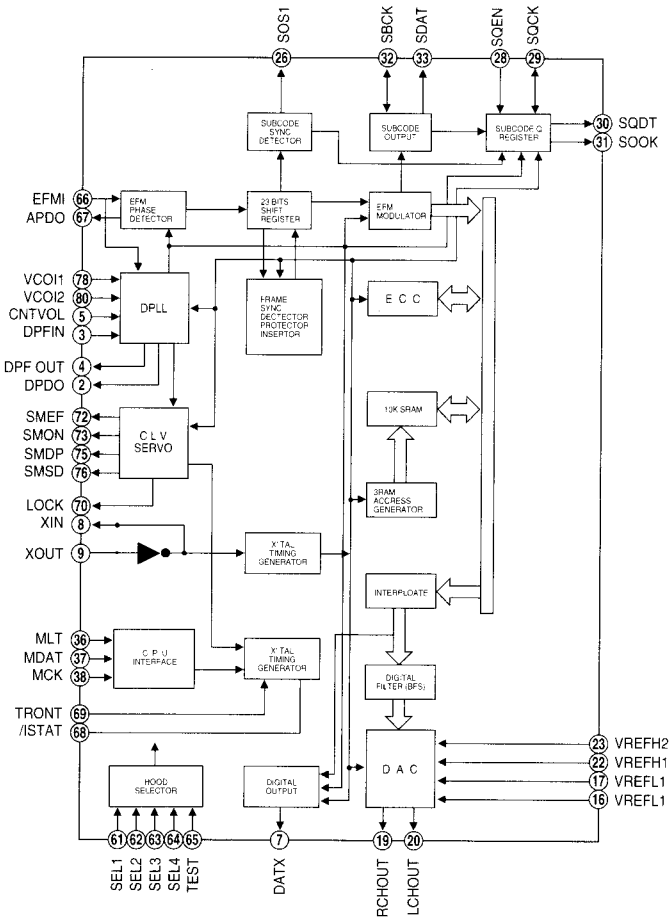
● KA9258D : NIC9258



● KA9220(ASSP) : NIC9220


ISET APDI BPF EFMO AASC DVEE (S) MCK MLT MDAT RESET DIRC TRCNT AVEE (S) N/C ISTAT PFSET CBH CPH N/C SLSTP SLEI SLEO SLEN TEST2
22 35 28 38 37 84 27 28 20 30 9 32 34 6 33 7 3 2 5 8 41 40 39 42
FVC 24
VREOI 21
VREO 23
FBM 36
N/C 14
LOCK 31
SMPD 12
SMON 13
SMEF 25
DVCC (S) 55
SPDI 43
SPDLO 44
WDCH 11
FOK 59
N/C 4
LDON 60
LOOP FILTER
EFM COMPARATOR
VREO & VIC
VCO 1-TIME
VCO 2-TIMES
CLV LPF
TTL TO COMS
COMS TO TTL
MIROR AMP & COMPA -RATOR
MICOM TO SERVO CONTROL AUTO SEQUENCER
FS1 TG4 TG1 TG2
FM1 TG7 PS1 TG2
DEFECT AMP & COMPARATOR
DEFECT AMP & COMPARATOR
ARC AMP
RF AMP
TRACKING ERROR AMP
FOCUS ERROR AMP
WINDOW COMPARATOR
TRACKING PHASE COMPENSATION
FOCUS PHASE COMPENSATION
10 AVCC (S)
54 TDFCT
47 TKEI
48 TKEO
72 AVCC(RF)
15 TGSW
16 RTG
50 ATS
51 TZC
52 TE2
53 TE1
49 N/C
20 FSCH
58 FDFCT
45 FCE
46 FSEO
65 66 67 78 70 71 75 74 69 73 74 76 62 61 68 79 80 1 33 57 56 19 18 17
RFI RFO RF P/N LD PD PD1 PD2 CV N/C E F EO EI RV DCC2 DCC1 AVEE (RF) FBIAS FE1 FE2 HF GO FSW LFR

● KS9282(DSP) : NIC9282



14. Electrical parts list

14-1. Tuner section

Static electricity

! indicates parts for circuit safeguarding purposes. Therefore,when replacing, be sure to use specified parts only.

Location no.	Code no.	Description & Specification	Q'ty	Remark
HR9	11018-277-181	R-CARBON;RD 1/4T 180-J	1	
IR16	11018-277-470	R-CARBON;RD 1/4T 47-J	1	
IVR3	11249-102-024	VR-SEMI TAPE-H;EVN CYA/EVN-DJAA03 B53(5k)	1	
IVR2	11249-102-034	VR-SEMI TAPE-H;EVN CYA/EVN-DJAA30 B14(10k)	1	
IVR1	11249-102-064	VR-SEMI TAPE-H;EVN CYA/EVN-DJAA30 B54(50k)	1	
IC7	11407-057-150	C-CERAMIC;CC45T CH 50V 15-J	1	
HC15,16	11407-057-200	C-CERAMIC;CC45T CH 50V 20-J	2	
IC24	11407-057-330	C-CERAMIC;CC45T CH 50V 33-J	1	
IC3,5,FC2,5,HC4,6,IC10	11417-344-473	C-CERAMIC,HK;CK45T F 50V 0.047M-Z	7	
FC3,HC17,18,IC21,20, 38,40,41	11448-010-223	CONDENSER AIXAL-LEAD;25V TP 050F22000-Z	8	
IC12,42,16,FC8,HC9	11449-010-473	CONDENSER AXIAL-LEAD;50V UP F47000-Z	5	
IC32	11449-118-689	CONDENSER AXIAL-LEAD;50V UP 050 SL6.8-K	1	
FC1,HC1,10,11,IC19, 35,36	1449-518-101	CONDENSER AXIAL-LEAD;50V UP050 B100	7	
IC39,37	11449-518-331	CONDENSER AXIAL-LEAD;50V UP050 B330	2	
HC13,12	11449-518-471	CONDENSER AXIAL-LEAD;50V UP050 B470	2	
IC14	11505-714-332	C-POLYESTER;CQ921T M 50V 0.0033M-K	1	
IC15	11505-714-183	C-POLYESTER;CQ921T M 50V 0.018M-K	1	
HC5	11505-714-273	C-POLYESTER;CQ921T M50V 0.027M-K	1	
IC28L,28R	11505-714-333	C-POLYESTER;CQ921T M 50V 0.033M-K	2	
IC6	11509-452-120	C-POLYSTYRENE;CQ09 S 50V 470-J	1	
HC21	11608-102-473	C-ELECTROLYTIC;SMS T 10V 47M(5X11)	1	
IC17,18,23	11608-103-103	C-ELECTROLYTIC;SMS T 16V 10M(5X11)	3	
HC14,IC34,11,22,FC4	11608-103-104	C-ELECTROLYTIC;SMS T 16V 100M(6.3X11)	5	
HC8	11608-103-223	C-ELECTROLYTIC;SMS T 16V 22M(5X11)	5	
IC25,26,13	11608-106-102	C-ELECTROLYTIC;SMS T 50V 1M(5X11)	1	
HC7	11608-106-222	C-ELECTROLYTIC;SMS T 50V 2.2M(5X11)	3	
IC27	11608-106-332	C-ELECTROLYTIC;SMS T 50V 3.3M(5X11)	1	
IC29L,29R	11608-106-472	C-ELECTROLYTIC;SMS T 50V 4.7M(5X11)	1	
ITC1,3	11829-512-030	C-TRIMMER;TZ03R 20PF	2	
IIC1	2119-102-720	IC AM,FM IF;LA1851N	2	
HIC1	12119-203-220	IC-FREQ SYNTHESIZER;LM7000	1	
HQ5	12139-201-100	TRANSISTOR;KSA928A-Y/KTA1273-Y TAPE	1	
HQ1,2	12149-301-820	TRANSISTOR;KSC1222-L,TAPE	2	
FQ1	12149-301-860	TRANSISTOR;KSC838-O ,TAPE	1	
HQ6	12149-301-900	TRANSISTOR;KSC 945-Y,TAPE	1	
IQ5,HQ3,4	12159-301-330	TR-DIGITAL;KSR2003/KRA103M TAPE	3	
IQ6	12159-301-780	TR DIGITAL;KSR1003/KRC103M TAPE	1	
FD1,2,3,4,5,6 FD7,8,10	12169-301-290	DIODE-SW;1SS53/1N4148,CT:6PF	9	
IZD1	12169-403-290	DIODE-ZN;50MW7.7-8.7V UZ-8.2BM	1	
ID1,2	12169-501-005	DIODE;KV 1236	2	
HL1,2	12429-411-101	COIL-CHOKE;AX 100UH-02(LAL02TB101K)	2	
IL5L,5R	12450-304-040	COIL-LOW PASS FILTER;FV-A D-BASE 19K 38K	2	
IL6 FM DET	12619-020-067	COIL 7 CAN;AB FM BLU	2	

Location no.	Code no.	Description & Specification	Q'ty	Remark
IL5 AM TFT	12619-030-005	COIL CAN ; AC 450KHZ, YEL	1	
IL3 OSC	12619-047-203	COIL CAN ; AD 110UH 786KHZ,RED	1	
IL1 MW ANT	12619-561-000	COIL MW ANT ; MURHN-K5268KAT 250MH	1	
TP3,4	13124-500-110	TEST PIN ; PI 1.0X13.5 MM RSRM2	2	
ICW1	13349-171-101	CONNECTOR-WAFER ; 53114-1010	1	!
ICW3	13349-512-561	CONNECTOR-WAFER ; 5267-02A 2P TAPE	1	!
FCF1,2	14529-301-753	FILTER CERAMIC ; SFE 10.7MS3G-A-TF2	2	T BAND
ICF1	14529-304-610	FILTER CERAMIC ; AHCM2-450BL	1	
BPF1	14529-403-010	FILTER L.C ; PFW-R4 RF-PF TYPE	1	
HX1	14539-501-140	CRYSTAL ; HC-49/U 7.2MHZ 12P	1	
IX1	14539-504-100	CERAMIC RESONATOR ; CSB456F15	1	
ICW 2	A6010-0989	CONNECTOR-HOUSING ;GB200-8S-LS BRN	1	
IJ1	A3059-0006	TERMINAL-BOARD,PUSH ; SP-030 4P ANT	1	
FP1(FM PACK)	B1290-0001	TUNER-FM ; FE415-G11 4G 750HM	1	
HZD1	12169-403-330	DIODE-IN ; UZP5.1B/RD5.1 EB1	1	
HR12	11018-377-220	R-CARBON ; 1/2 22Ω	1	Option
	19129-0396-00	ASSY TUNER PCB ; MM77 T BAND		Option
	19129-0396-01	ASSY TUNER PCB ; MM77 LW EXP		
ITC2,4	11829-512-030	C-TRIMMER ; TZ03R 20PF	2	LW Option
IL4	12619-047-202	COIL-CAN ; AD 510UH 220KHZ,BRN	1	"
IL2	12619-566-913	COIL-TRANS TEN,CAN ; AF2.4MH FLW RED	1	"
ISW1	13519-930-223	SWITCH-SLIDE ; 00120050 IC-2P STICK	1	"
IJ1	A3059-0007	TERMINAL-BOARD,PUSH ; SP-031 3P ANT	1	Option
FCF1,2,3	14529-301-770	FILTER-CERAMIC ; SFE 10.7MJ RED	3	"
IL10	12429-505-100	COIL CHOKE ; RA10MH-K	1	"

14-2. Deck section

Location no.	Code no.	Description & Specification	Q'ty	Remark
UR51,52	11018-377-681	R-CARBON ; RD 1/2T 680-J	2	
JR27	11018-377-101	R-CARBON ; RD100-J	1	
UVR51	11249-102-103	VR-SEMI TAPE-V; EVN-DCA A03R23(2K)	1	
JC20L,20R	11407-018-221	C-CERAMIC ; CC45T SL 50V 220K	2	
JC31	11417-344-473	C-CERAMIC,HK ; CK45T F 50V 0.047M-Z	1	
JC2L,2R	11447-619-122	CONDENSER AXIAL-LEAD ; 16V EP050 x 120-W	2	
JC16L,16R	11447-619-222	CONDENSER AXIAL-LEAD ; 16V EP050 x 2200-M	2	
JC9L,9R	11447-910-103	CONDENSER AXIAL-LEAD ; 16 V EP050 x 10000-N	2	
UC51,JC35	11448-010-223	CONDENSER AXIAL-LEAD ; 25V TP 050F2200-Z	2	
JC11L	11449-010-473	CONDENSER AXIAL-LEAD ; 50V UP F47000-Z	1	
JC1L,1R	11449-117-100	CONDENSER AXIAL-LEAD ; 50V UP 050 SL10-J	2	
JC14L,14R,7L,7R 5L, 5R, JC32	11449-518-101	CONDENSER AXIAL-LEAD ; 50V UP050 B100-K	7	
JC6L,6R	11449-518-102	CONDENSER AXIAL-LEAD ; 50V UP050 B1000-K	2	
JC24	11505-713-103	C-POLYESTER ; CQ921T M 50V 0.01M-J	1	
JC3L,3L	11505-713-183	C-POLYESTER ; CQ921T M50V 0.018M-J	2	
JC21	11505-714-153	C-POLYESTER ; CQ921T M 50V 0.015M-K	1	
JC23	11505-714-222	C-POLYESTER ; CQ921T M 50V 0.0022M-K	1	
JC26	11505-714-332	C-POLYESTER ; CQ921T M 50V 0.0033M-K	1	
JC70	11608-102-104	C-ELECTROLYTIC ; SMS T 10V 100M(6.3X11)	1	
JC10L,11R	11608-103-104	C-ELECTROLYTIC ; SMS T 16V 100M(6.3X11)	3	
JC22,25,19R	11608-104-473	C-ELECTROLYTIC ; SMS T 25V 47M(5X11)	3	
JC8L,8R	11608-106-102	C-ELECTROLYTIC ; SMS T 50V 47M(5X11)	2	
JC4L,4R,13L,13R 17R	11608-103-473	C-ELECTROLYTIC ; SMS T 16V 47M(5X11)	5	
JC15R,12L,12R	11608-106-332	C-ELECTROLYTIC; SMS T 50V 3.3M	5	
JC15L	11608-156-332	C-ELECTROLYTIC ; SRA T 50V 3.3M	1	
UQ52,51	12139-201-100	TRANSISTOR ; KSA928A-Y/KTA1273-Y TAPE	2	
JQ3L3R,10,57	12149-301-900	TRANSISTOR ; KSC 945-Y, TPAE	4	
JQ5,6	12149-301-910	TRANSISTOR ; KSC 2331-Y/TAPE	2	
JQ11	12159-301-330	TR-DIGITAL ; KSR2003/KRA103M TPAE	1	
UQ54,53	12159-301-780	TR DIGITAL ; KSR1003/KRC103M TPAE	2	
JD1L,1R,2L,2R,3L,3R, 5, UD51,54, 52	12169-301-290	DIODE-SW ; 1SS53/1N4148,CT:6PF	10	
JL1L,1R	12429-306-113	COIL-BIAS TRAP ; FB895-85A	2	
JL2AC BIAS	12619-577-771	COIL-BIAS OSC ; PCHNS-5371EQJ	1	
JCW1	16439-0211-00	CONNECTOR-WIRE/B.S ; EHR/5395-05 2547	1	
JCW3	16439-0210-00	CONNECTOR-WIRE-BS ; S264/5395-06 2547	1	
JCW4	A6010-1529	CONNECTOR-HOUSING ; 18-5083-019-000 WHT	1	
JCW5	13078-472-125	CONNECTOR-WIRE/B.S ; 5264-02/5395	1	
JIC1	A4012-0070	IC-LINEAR ; KA22291 DIP PRE/REC AMP	1	
JQ1L,1R	B4054-0023	FET ; 2SK373-Y 400MW 6.5MA 100V N-CHANNEL	2	
JCW2	B6010-0399	CONNECTOR-WAFER ; 52328-1310 13P WHT	1	
JQ7	12159-301-800	TR ; KSR1007/KRC108M	1	
JC12L,12R,15L,15R	19129-0397-01	ASSY DECK PCB ; MM77E		
JQ40	12149-301-900	TRANSISTOR ; KSC945-Y	1	LW Option

14-3. Main section

Location no.	Code no.	Description & Specification	Q'ty	Remark
RR12	11018-277-102	R-CARBON;RD 1/4T 1K-J	1	
AR20L,20R	11018-277-331	R-CARBON;RD 1/4T 330-J	2	
RR21	11018-277-221	R-CARBON;RD 1/4T 220-J	1	
RR14,16,24	11018-277-223	R-CARBON;RD 1/4T 22K-J	3	
RR15	11048-477-561	R-METAL OXIDE;RS1P 560-J MINI TYPE	1	
RR3	11058-223-101	R-FUSIBLE;CRF 1/4W 100-J	1	!
RR2	11058-377-011	R-FUSIBLE;RF 1/2T 1-J	1	!
RR1	11058-577-010	R-FUSIBLE;2T 1-J	1	!
POWER IC	11123-0051-00	HEAT-SINK ; MM77 AL 84X65X37	1	!
MVR-1	11209-109-130	VR-SIG;RK16K1110 002 13B	1	
RC7,15,17	11417-344-473	C-CERAMIC,HK;CK45T F 50V 0.047M-Z	3	
QC19L,19R,14L,14R, 13L,13R	11447-619-122	CONDENSER AXIAL-LEAD;16V EP050 X1200-M	6	
QC17L,17R,15L,15R, QC40L,40R	11447-619-392	CONDENSER AXIAL-LEAD;16V EP050 X3900-M	6	
JC61	11447-619-472	CONDENSER AXIAL-LEAD;16V EP050 X4700-M	1	
QC20L,20R	11447-919-822	CONDENSER AXIAL-LEAD;16V EP050 Y8200-M	2	
AUC3,BC10, 41L,41R	11448-010-223	CONDENSER AIXAL-LEAD;25V TP 050F22000-Z	4	
EC40L,40R	11449-010-473	CONDENSER AXIAL-LEAD;50V UP F47000-Z	2	
QC4L,4R	11449-117-100	CONDENSER AXIAL-LEAD;50V UP 050 SL10-J	2	
AC5L,5R	11449-117-330	CONDENSER AXIAL-LEAD;50V UP 050 SL33-J	2	
QC10L,10R	11449-117-470	CONDENSER AXIAL-LEAD;50V UP 050 SL47-J	2	
AUC1L,1R,MC2,MC3	11449-518-101	CONDENSER AXIAL-LEAD;50V UP050 B100-K	4	
BC5,6,QC8L,8R,24,23 PC1L,1R,QC31,1L	11449-518-102	CONDENSER AXIAL-LEAD;50V UP050 B1000-K	10	
UC61,62,63	11449-518-331	CONDENSER AXIAL-LEAD;50V UP050 B330-K	3	
AC2L,2R	11449-518-471	CONDENSER AXIAL-LEAD;50V UP050 B470-K	2	
AC7L,7R	11505-713-154	C-POLYESTER;TAPING 0.15MF-J 50V	2	
QC12L,12R	11505-713-563	C-POLYESTER;CQ921T M 50V 0.056M-J	2	
QC16L,16R,18L,18R	11505-714-273	C-POLYESTER;CQ921T M50V 0.027M-K	4	!
JC51	11505-714-472	C-POLYESTER;CQ921T M 50V 0.0047M-K	1	
EC1L,1R	11505-714-683	C-POLYESTER;CQ921T M 50V 0.068M-K	2	
RC1,2,3,4	11607-105-222	C-ELECTROLYTIC;MC SMS 35V 2200M(16X31.5)/F	4	
EC14,UC60	11608-102-104	C-ELECTROLYTIC;SMS T 10V 100M(5X11)	2	
EC2	11608-102-331	C-ELECTROLYTIC;SMS T 10V 330M(8X11.5)	1	
QC3L,3R,RC13,18,AC8	11608-102-473	C-ELECTROLYTIC;SMS T 10V 47M(5X11)	5	
AUC2L,2R,BC4,2L,2R,3, EC13R, QC2L,7L,7R,9L, 9R,32,EC13L	11608-103-103	C-ELECTROLYTIC ; SMS T 16V 10M(5X11)	14	
BC1,QC5L,5R,22,EC14R EC14L,RC9	11608-103-104	C-ELECTROLYTIC;SMS T 16V 100M(6.3X11)	7	
RC14	11608-103-221	C-ELECTROLYTIC;SMS T 16V 220M(8X11.5)	1	
QC30R	11608-103-471	C-ELECTROLYTIC;SMS T 16V 470M(10X12.5)	1	
AC4L,4R	11608-104-103	C-ELECTROLYTIC;SMS T 25V 10M(5X11)	2	
RC12	11608-104-104	C-ELECTROLYTIC;SMS T 25V 100M(6.3X11)	1	
RC10	11608-104-221	C-ELECTROLYTIC;SMS T 25V 220M(8X11.5)	1	

Location no.	Code no.	Description & Specification	Q'ty	Remark
BC8,QC30,MC1	11608-106-102	C-ELECTROLYTIC;SMS T 50V 1M(5X11)	6	
10, EC41L,41R				
JC53	11608-106-221	C-ELECTROLYTIC;SMS T 50V 0.22M(5X11)	1	
QC11L,11R,JC55,56,EC12	11608-106-222	C-ELECTROLYTIC;SMS T 50V 2.2M(5X11)	5	
EC16L,16R,JC54	11608-106-332	C-ELECTROLYTIC;SMS T 50V 3.3M(5X11)	3	
MC5,JC57,RC5	11608-106-470	C-ELECTROLYTIC;SMS T 50V 47M(6.3X11)	3	
MC6	11608-106-338	C-ELECTROLYTIC;SMS T 50V 0.33M(6.3X11)	1	
MC4,AC3L,3R,MC7	11608-106-472	C-ELECTROLYTIC;SMS T 50V 4.7M(5X11)	1	
EC4,30	11608-153-101	C-ELECTROLYTIC ; SRA T 16V 100M(6.3X7)	2	
EC5	11608-153-473	C-ELECTROLYTIC;SRA T 16V 47M(6.3X7)	1	
EC8L,8R,9L,9R,10L,10R	11608-156-102	C-ELECTROLYTIC;SRA T 50V 1M(4X7)	6	
EC11L,11R	11608-156-222	C-ELECTROLYTIC;SRA T 50V 2.2M(4X7)	2	
BIC1,QIC1	B4004-0416	IC-MULTIPLEXER 4CHX2;MC14052BCP	2	
JIC2	12119-201-610	IC-AMPS;LA2010	1	
EIC2,3,5,QIC2,3,MIC1	12119-401-630	IC-DUAL OPAMP ;MC4558S/NJM4558S	6	
RIC2	12119-601-770	IC-REGULATOR;MC7805	1	
RQ3	12139-103-560	TRANSISTOR;KSA 614-O	1	
BQ2,EQ3,AQ4	12149-101-520	TRANSISTOR;KSA733-Y,TAPE	3	
QQ1,2,EQ6,7,RQ5,11	12149-301-900	TRANSISTOR;KSC 945-Y,TAPE	10	
EQ1L,1R,AQ1L,1R,				
BQ1,4,5				
JQ1	12149-301-930	TRANSISTOR;KSC1008-Y,TAPE	1	
RQ1,2,6	12149-401-070	TRANSISTOR;KSD73-Y	3	!
RQ9	12149-401-950	TRANSISTOR;KSD 882-Y	1	!
RQ7	12159-301-330	TR-DIGITAL;KSR2003/KRA103M TAPE	1	
RQ8,EQ5,AQ2	12159-301-780	TR DIGITAL;KSR1003/KRC103M TAPE	3	
EQ2,BQ3L,3R	12159-301-790	TR DIGITAL;KSR1009/KRC110M TAPE	3	
RD7,15,16,17	12169-201-090	DIODE-RECTIFIER;1N 4002,TAPE	4	
RD3,4,5,6,8,9	12169-201-140	DIODE;IN5392 TAPING/R	8	!
RD10,11				
RD1	12169-219-330	DIODE-BRIDG;PBL403	1	!
AUD1L,1R,RD13,12,ED5L,5R	12169-301-290	DIODE-SW;1SS53/1N4148,CT:6PF	12	
UD1,AD1,2,3 ,ED4L,ED4R				
RZD3	12169-403-240	DIODE-ZN;1W9.4-10.6V UZP-10B	1	!
RZD5	12169-403-340	DIODE-ZENER;UZP-9.1B/RD9.1F 1W	1	!
RZD4,7,8	12169-403-910	DIODE-ZN;1W11.4-12.6V UZP-12B	3	!
RZD1,6	12169-404-110	DIODE-ZN;RD5.6FB/UZP-5.6B	2	!
EL7,6L,6R,UL10,11,12,	12429-411-101	COIL-CHOKE;AX 100UH-02(LAL02TB101K)	8	
13,61				
AJ1	13339-101-502	JACK-HEADPHONE;SHQ9085-01-142(GRN)	1	
MJ1	B3040-0119	JACK-HEADPHONE;PI3.5 HSJ0918-01-2010	1	
AJ2	13303-500-620	TERMINAL,BOARD PUSH ; 4P PUSH HOOK	1	
AUJ1	13339-544-040	JACK-RCA ; ABS & BST2 2P(S-436)	1	
MCW7	13349-103-103	CONNECTOR-WAFER ; 5267-10A 10P STICK	1	
MCW4	13349-171-071	CONNECTOR-WAFER ; 53114-0710	1	
PL1	12429-070-350	COIL-CHOKE ; AX1.2UH-03(LAL03TB1R2M)	1	

Location no.	Code no.	Description & Specification	Q'ty	Remark
MCW1,2,3	13349-171-101	CONNECTOR-WAFER ; 53114-0710	3	
MCW5	13349-512-565	CONNECTOR-WAFER ; 5267-06A 6P STICK	1	
RQ1,2,6	15684-507-610	HEAT-SINK;AL EXTR WHT 30H,MQ6T	3	
RZD2	A4106-0104	DIODE-ZENER;UZP-27B 25.5/30V 10MA T	1	!
MCW9	A6010-0370	CONNECTOR-WAFER ;GB200-8P-TS YEL	1	
MCW8	A6010-1528	CONNECTOR-WAFER ;28-5083-019-000 WHT	1	
UIC3	B4002-0216	IC-CPU;MC74HC259N AUDIO DIP	1	
AIC1,2	B4012-0339	IC TDA2052 DIP POWER AMP	2	
EIC1	B4012-0415	C-LINEAR;TC9154AP DIP ELEC VR	1	
MR12	11018-277-101	R-CARBON ; RD 1/4T 100-J	1	!
RR22	11018-377-121	R-CARBON ; RD 0.5T 120-J	1	!
RR20	11018-377-152	R-CARBON ; RD 1.5T 1.5K-J	1	!
RR9	11018-377-181	R-CARBON ; RD 0.5T 180-J	1	!
RR4,5	11018-377-220	R-CARBON ; RD 0.5T 22-J	2	!
RR10,8,18	11018-377-391	R-CARBON ; RD 0.5T 390-J	3	!
AR9L,9R	11018-377-479	R-CARBON ; RD 0.5T 4.7-J	2	!
RR6	11018-377-561	R-CARBON ; RD 0.5T 560-J	1	!
RF1	14709-241-280	FUSE ; T 250V 3.15A 20 EUR	1	!
QCW1	A6010-1696	CONNECTOR-WAFER ; 35306-0320 WHT MOLEX	1	!
	19129-0401-01	ASSY MAIN PCB ; MM-77E	1	
MCW6	16439-0204-00	CONNECTOR-WIRE/B.S ; 51004/5295-08	1	
ETP1	16634-517-300	CORD CLAMP; DALA-2	1	
RZD2	A4106-0104	DIODE-ZENER ; UZP-27B 25.5/30V	1	!
AL1R,1L,2R/2L	12429-060-030	COIL-CHOKE ; 2R2UH-K	4	

14-4. Front section

Location no.	Code no.	Description & Specification	Q'ty	Remark
UC121,122	11407-057-390	C-CERAMIC;CC45T CH 50V 39-J	2	
UC103,117	11417-104-104	C-CERAMIC;CK45T F12V 100000-Z	2	
UC108,133,135,136	11448-010-223	CONDENSER AIXAL-LEAD;25V TP 050F22000-Z	4	
UC109,113,118,116,	11449-010-473	CONDENSER AXIAL-LEAD;50V UP F47000-Z	8	
UC132,137,123,125				
UC104,106,107	11449-518-102	CONDENSER AXIAL-LEAD;50V UP050 B1000-K	3	
UC110,128	11449-518-331	CONDENSER AXIAL-LEAD;50V UP050 B330-K	2	
UC112,114,127	11608-102-104	C-ELECTROLYTIC;SMS T 10V 200M(6.3X11)	3	
UC130	11608-106-224	C-ELECTROLYTIC;SMS T 50V 1M(5X11)	1	
UC129	11608-152-104	C-ELECTROLYTIC;SRA T 10V 100M(6.3X7)		
UC102,101,126	11608-156-222	C-ELECTROLYTIC;SRA T 50V 2.2M(4X7)	1	
UQ103	12149-202-050	TRANSISTOR;KSB564A-Y	3	
UQ101,102,104	12149-301-900	TRANSISTOR;KSC 945-Y,TAPE	1	
UD103,104,105,	12169-301-290	DIODE-SW;1SS53/1N4148,CT:6PF	3	
106,107,102			6	
UL116	12429-411-100	COIL-CHOKE;AX 10UH-02(LA02TB100K)		
UL114,115	12429-411-101	COIL-CHOKE;AX 100UH-02(LAL02TB101K)	1	
UW1	13349-511-573	CONNECTOR-WAFER ;5268-02A	2	
UCW6	13349-170-071	CONNECTOR-WAFER;52170-0710	1	
UCW3,4,5,2	13349-170-101	CONNECTOR-WAFER;52170-1010	1	
USW111	13559-901-100	SWITCH-TACT;SKHV10910A	4	
UX101	14539-501-090	X-TAL;8.4672MHZ	1	
UE101	A1294-0041	MODULE-REMOCON;RC-38S2L 38KHZ	1	
UF1 FLT DISPLAY	A4153-0095	V.F.DISPLAY;BJ335GK MM-77 TR W89 L54	1	
UCW1	A6010-1527	CONNECTOR-WAFER;5541-09J1 WHT	1	
UIC2	B4002-0216	IC-CPU;MC74HC259N AUDIO DIP	1	
UCW7	B6010-1549	CONNECTOR-FPC;52492-1620 WHT J/MOLE	1	
TO CD	B6032-0070	WIRE-PLATE;16/300 BNCD-P=1.25-L-16-290 WHT	1	
UR205	B1018-0079	R NETWORK ; RN 0.075 X 4P 104-J RYLS3J104	1	
UR203,204	B1018-0080	R NETWORK ; RN 0.075 X 8P 104-J RYLS7J104	1	
UR200,201	B1018-0082	R NETWORK ; RN 0.075 X8P 472-J RYLS7J472	2	
UC115,124	B1104-0540	C ELEC ; CE 92 W5.5V T 473-Z FMOH473	2	
UIC1	B4002-0680	IC MCU ; LC86624A-LC866224A-5818/5845 MM-77	1	
	19219-0400-00	ASSY FRONT PCB ; MM77		T BAND(option)
	19219-0400-05	ASSY FRONT PCB ; MM77		LW BAND(option)

14-5. Power section

Location no.	Code no.	Description & Specification	Q'ty	Remark
P/T	A1199-0130	TRANS-POWER ; 66X40 115/230V 50/60HZ		!
RGT1	13349-444-030	CONNECTOR-WAFER ; GT-PIN UL94V-1	1	
RF100	14709-241-190	FUSE ; T 250V 800mA 20 EUR	1	! (Option)
RF200	14709-241-220	FUSE ; T 250V 1.25A 20EUR	1	! (Option)
RL101,102	12429-010-330	COIL CHOKE RND ; 27UH-K Q30 F2R5	2	! (Option)
R101,102	11469-501-070	C-CERAMIC.AC ; DE7100FZ 472P	2	! (Option)

14-6. Control PCB section

Location no.	Code no.	Description & Specification	Q'ty	Remark
UW1	13088-472-212	CONNECTOR-WIRE;5268-02A	1	
USW105,104,110,103,106	13559-901-100	SWITCH-TACT;SKHV10910A	10	
USW107,108,109,102,101				

14-7. LED section

Location no.	Code no.	Description & Specification	Q'ty	Remark
UQ2,8	12159-301-330	TR-DIGITAL;KSR2003/KRA103M TAPE	2	
UQ4,3,1,5,6,7	12159-301-780	TR DIGITAL;KSR1003/KRC103M TAPE	6	
UD50,51,52,53,54,55	12169-301-290	DIODE-SW;1SS53/1N4148,CT:6PF	6	
JWC10	13349-133-090	CONNECTOR-WAFER;42140-09A WHT	1	
USW1,2,3,4,5,6	13559-901-100	SWITCH-TACT;SKHV10910A	6	
UD3,4,7,12,15	A4150-0288	LED-LAMP;SLR34DCN49 ORG T PI2.5	5	
UD1,5,8,9,10,14	A4150-0289	LED-LAMP;SLR34YCN49 YEL T PI2.5	6	
UD2,6,11,13,16,17	A4150-0290	LED-LAMP;SLR34PCN49 GRN T PI2.5	4	
	19129-0398-00	ASSY LED PCB ; MM77		
UR1	11018-277-102	R-CARBON ; RD 1/4 T 1K-J	1	
UR15	11018-277-682	R-CARBON ; RD 1/4T 680-J	1	
UR2	11018-277-821	R-CARBON ; RD 1/4T 820-J	1	

14-8. CD section

Location no.	Code no.	Description & Specification	Q'ty	Remark
NR555	11058-277-229	R-FUSIBLE;RF 1/4T 2.2-J	1	
NR606,611,608,609,610	11119-101-000	R-CHIP;SCR2012 PA.P 1/8 O-J	5	
NR102,109,205,45L,45R	11119-101-102	R-CHIP;MCR10,1K-J	5	
NR47L,47R,104,203,NRD	11119-101-104	R-CHIP;MCR10,2012S 100K-J	5	
NR42L,42R,114	11119-101-105	R-CHIP;MCR10,2012S 1M-J	3	
NR41L,41R,204,191,100	11119-101-123	R-CHIP;SCR2012J123 100CT	6	
NR190				
NR106,107	11119-101-124	R-CHIP;SCR2012 120K-J	2	
NR110	11119-101-153	R-CHIP;SCR2012J153 100CT	1	
NR103,119	11119-101-154	R-CHIP;MCR 10,2012S 150K-J	2	
NR115	11119-101-184	R-CHIP;SCR2012 180K-J	1	
NR101	11119-101-220	R-CHIP;SCR2012J 220 100CT	1	
NR40L,40R	11119-101-223	R-CHIP;MCR10,2012S 22K-J	2	
NR43L,43R,200	11119-101-273	R-CHIP;MCR10,2012S 27K-J	3	
NR201,202	11119-101-332	R-CHIP;SCR2012S 3.3K-J	2	
NR105	11119-101-393	R-CHIP;SCR2012 10V 39K-J	1	
NR117	11119-101-434	R-CHIP;MCR 10,2012S 430K-J	1	
NR44L,44R,46L,46R	11119-101-472	R-CHIP;MCR 10,2012S 4.7K-J	4	
NR111,108	11119-101-473	R-CHIP;MCR 10,2012S 47K-J	2	
NR112	11119-101-563	R-CHIP;SCR2012 56K-J	1	
NR605	11119-101-683	R-CHIP;SCR2012J 683 100CT	1	
NR116	11119-101-824	R-CHIP;SCR2012 824J	1	
NR118	11119-102-820	R-CHIP;SCR2012 1/8 PL,P 82-F	1	
NC204,124	11128-018-474	C-CHIP CERAMIC;GRM40 Y5V 474Z16-530	2	
NC119,120,121,107,108	11129-001-104	C-CHIP CERAMIC;2012 SL 104-K 50V	6	
NC603				
NC41L,41R	11129-001-122	C-CHIP CERAMIC;SMC2012 122K	2	
NC1000,1001	11129-001-151	C-CHIP,CERAMIC;C2012 SL 1H 151K	2	
NC118	11129-001-331	C-CHIP CERAMIC;C2012 SL 1H 331K	1	
NC113,125,101	11129-001-333	C-CHIP CERAMIC;SMC2012 333K	3	
NC109,104,42R,43L	11129-004-102	C-CHIP CERAMIC;C2012 X7R 1H 102K	4	
NC205,110,116,102,103	11129-004-103	C-CHIP CERAMIC;SMC2012B 103K 500P	11	
43R,44L,500,600,601,602				
NC201	11129-004-152	C-CHIP CERAMIC;SMC2012B 152K 500P	1	
NC112	11129-004-222	C-CHIP CERAMIC;C2012X7R 1H222K	1	
NC200	11129-004-473	C-CHIP,CERAMIC;C2012B 473K	1	
NC111	11129-004-682	C-CHIP CERAMIC;C2012 X7R 1H 682K	1	
NC115	11129-004-683	C-CHIP CERAMIC;SMC2012B 683K 500P	1	
NC190	11129-009-080	C-CHIP CERAMIC;SMC 2012 CH 080 J50P	1	
NC202,203	11129-009-270	C-CHIP CERAMIC;C2012 CH 1H 27-J	2	
NC100	11129-012-472	C-CHIP CERAMIC;C2012SX7R 1H 472K	1	
NC45R,46L	11129-019-561	C-CHIP CERAMIC;SMC2012 PA.P 16V 561	2	
NL100	11176-600-040	COIL-CHIP;LQH3C 101K(5)	1	
NVR1702,1703,1704	11249-102-043	VR-SEMI TAPE-V;EVN-DCA A03B24(20K)	3	
NVR1701	11249-102-063	VR-SEMI TAPE-V;EVN-DCA A03B54(50K)	1	

Location no.	Code no.	Description & Specification	Q'ty	Remark
NC703	11608-102-224	C-ELECTROLYTIC;SMS T 10V 220M(6.3X11)	1	
NC114	11608-103-103	C-ELECTROLYTIC;SMS T 16V 10M(5X11)	1	
NC117	11608-106-471	C-ELECTROLYTIC;SMS T 50V 0.47M(5X11)	2	
NC702,105	11608-152-101	C-ELECTROLYTIC;SRE T 10V 100M(6.3X5)	1	
NC42L	11608-153-470	C-ELECTROLYTIC;SRE T 16V 47M(6.3X5)	5	
NC45L,44R,40L,40R	11608-154-479	C-ELECTROLYTIC;SRE T 25V 4.7M(3X5)	2	
122				
NC700,701	11608-171-221	C-ELECTROLYTIC : SRE T 4V 220M(6.3 X5)		
	12074-0024-00	SHIELD-PLATE;MM-77 T0.3 SPTE	1	
NIC1641	12119-203-500	IC MOTOR DRIVER;LB1641	1	
NIC05	12119-601-160	IC-REGULATOR;TA78L005/MC 78L05AC	1	
NQ1501	12139-201-100	TRANSISTOR;KSA928A-Y/KTA1273-Y TAPE	1	
NQ1502	12149-202-050	TRANSISTOR;KSB564A-Y	1	
NQ1503	12159-301-780	TR DIGITAL;KSR1003/KRC103M TAPE	1	
ND200,201,202,203	12169-301-290	DIODE-SW;1SS53/1N4148,CT:6PF	4	
NZD101	12169-404-800	DIODE ZENER;500MW UZ-6.2BSB TAPING	1	
NCW104	13349-139-061	CONNECTOR-WAFER;53015-0610 2.0MM	1	
NCW101	13349-139-080	CONNECTOR-WAFER;53015-0810 2.0MM	1	
NS100	13564-601-100	SWITCH-LEAF;MSW-1731CVC	1	
NXF100	14539-503-083	CERAMIC-RESONATOR;CSA 16.93MX040-TF01S	1	
NC2000	A1100-0909	C-CERAMIC;CC 73 COG 16V T 040-J C20	1	
NIC9270	A4012-0089	IC-LINEAR;KA9270D SOP AUDIO FILTER	1	
NIC9258	A4012-0169	IC-LINEAR;KA9258 SOP CD-4CH DRIVER	1	
NIC9220	A4012-0290	IC-LINEAR;KA9220 QFP RF+SSP	1	
NIC9282	A4012-0291	IC-LINEAR;KS9282 QFP DSP+DAC+DPLL	1	
NCW100	A6010-1523	CONNECTOR-WAFER;00-6200-167-012-800 BRN	1	
NCW103	A6010-1525	CONNECTOR-WAFER;28-6216-016-100-808 BLK	1	
	16024-0366-00	P.C.B CD MAIN ; G3A8 T1.6 W180 L230	1	

15. List of Abbreviation

ANT	: Antennas	L	: Left, Low
Addr	: Address	LED	: Light Emiting Diode
ADJ.	: Adjustment	LPF	: Low Pass Filter
AGC	: Automatic Gain Control		
AMP	: Amplifier	Max.	: Maximum
ASSY	: Assembly	MHz	: Megahertz
APC	: Auto power control	Min.	: Minimum
		MOD	: Modulation
BAT	: Battery	MPX	: Multiplex
BTN	: Button	MGSW	: Magazine Switch
BAL	: Balance	MGLS	: Magazine Limit Switch
BLK	: Black	MGLK	: Magazine Limit Switch
BLU	: Blue		
BPF	: Band Pass Filter	NF of NFB	: Negative Feedback
BRKT	: Bracket		
		OP AMP	: Operational Amplifier
C	: Chip	ORG	: Orange
CF	: Ceramic Filter	OSC	: Oscillator
ch	: channel		
cm	: centimeter	PB	: Playback
COM	: Common	PCB	: Printed Circuit Board
CDPS	: Disc Photo Sensor	PLL	: Phase Lock Loop
		P/T	: Power Transformer
D	: Diode		
D	: Depth	R	: Right
D/A Convertor	: Digital/Analog Convertor	RAM	: Random Access Memory
dB	: decibel	REC	: Record
DC	: Direct Current	REG	: Regulator
DEC	: Decoder	REW	: Rewind
DET	: Decector	RF	: Radio Frequency
DEV	: Deviation	ROM	: Read Only Memory
DSP	: Digital Signal Processor	R/P	: Record/Play
DTS	: Digiatl Tuning System	SP	: Spring
DCMT	: Disc Motor	sec.	: Second
DSCKC	: Disc Lock Sw	SSG	: Standard Signal Generator
		SSP	: Servo Signal Processor
EA	: Each	ST	: Stereo
ELPS	: Elevator Photo Sensor	ST/EJT	: Stop/Eject
ELLM	: Elevator Limit Sw	SW	: Switch, Short wave
ELMT	: Elevator Motor	TP	: Test Point
EQ	: Equalizer	TR	: Transistor
EJ	: Eject	TRANS	: Transformet
FF	: Fast forward	V	: Volt
F/F	: Flip Flop	VIO	: Violet
Fig	: Figure	VCO	: Voltage Controlled Oscillate
FREQ.	: Frequency	VOL	: Volume
		Vpp	: Voltage peat or peak
GND	: Ground	VR	: Volume
GRN	: Green	Vref	: Reference Voltage
GRY	: Gray	V/SEL	: Voltage selector
		VTVM	: Vacuum Tube Volt Meter
H	: Height, High	VVC	: Voltage Variabel Capacitance
Hz	: Hertz		
		W	: Watt or Weight
IB	: Instruction Booklet	WHT	: White
IC	: Integrated Circuit	X or X-tal	: Crystal
I/O	: Input/Output	YEL	: Yellow
KHz	: Killohertz		
Kg	: Killogram		